29

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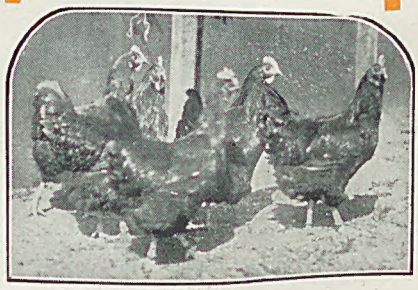

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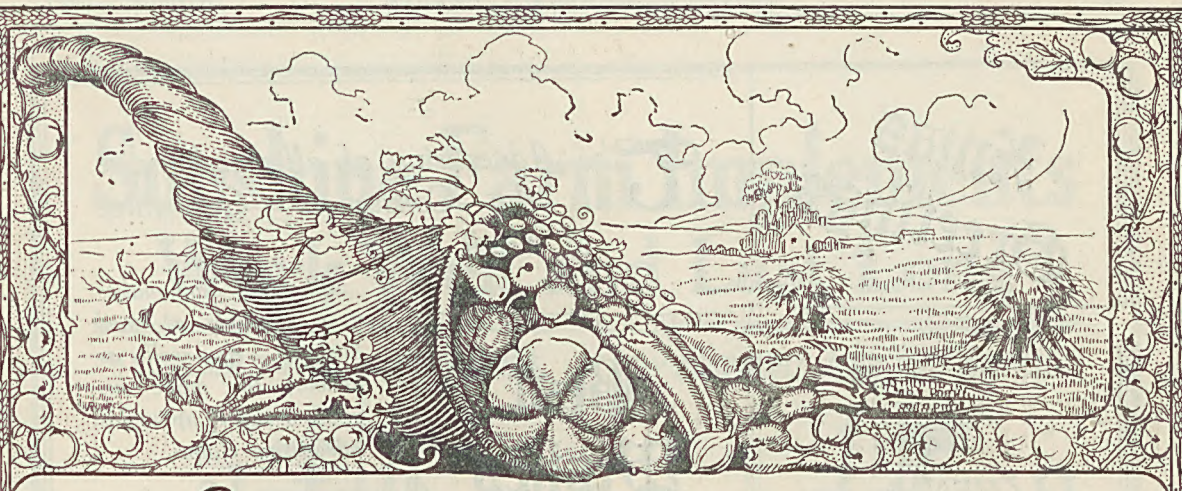

Contents. DECEMBER, 1931.

		PAGE
The Rye Grasses	*F. R. Drake, B.Agr.Sc.*	573
Tobacco Growing	*W. J. B. McDonald, B.Agr.Sc., and G. E. Coghlan*	578
Removal of Arsenical Spray Residue from Apples	*A. G. Strickland, M.Agr.Sc.*	586
Experimental Shipment of Navel Oranges	*Assoc. Professor W. J. Young and F. M. Read, M.Agr.Sc.*	590
Cold Storage and Preservation of Eggs	*W. C. Rugg*	594
An Export Orange	*J. M. Ward*	596
Orchard and Garden Notes	*E. E. Pescott, F.L.S.*	597
Professional Paper—		
Some Soil Types of Victorian Irrigation Areas	*W. R. Jewell, M.Sc., F.I.C.*	598
Standard Herd Records for Quarter ended 30th September, 1931		608

Issued under the direction of the Hon. W. Slater, M.L.A., Minister of Agriculture.

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INDEX TO ADVERTISEMENTS

FRONT SECTION

Cooper Engineering Coy. Ltd. viii
Gippsland & Northern Co-operative Coy. Ltd. v
Hardie, Jas., & Coy. Ltd. vi
Harper, Robt., & Coy. Ltd. x
International Harvester Coy. Ltd. vii
Victot Leggo & Farmers Ltd. v
Lysaght Bros. & Coy. Pty. Ltd. iv
Moore, Malcolm, Ltd. vi
H. V. McKay Massey Harris Pty. Ltd. ... iii
Selby, H. B., and Coy. ix
State Savings Bank of Victoria iv
Trustees, Executors and Agency Co. Ltd. ... ix

BACK SECTION

Australian Cement Ltd. xii
Australian Mutual Insurance Coy. Ltd. ... xiii
Cockbill, J. xii
C.O.R. xiv
Commonwealth Fertilizers and Chemicals Ltd. xviii
Dandy Poultry Food xiv
Fordson Tractor xv
Gerrard Wire-Tying Machines Pty. Ltd. ... xvi
Government Cool Stores xvii
Harvey, D. xx
London & North-Eastern Railway ... xiii
National Trustees, Executors and Agency Coy. Ltd. xviii
Rylands Bros. (Aust.) Ltd. xiii
Shell Company of Australia Ltd. xi
Trewhella Bros. Pty. Ltd. xii
Victoria Insurance Company xvi
Victorian Railways xi
Wells, W. xvi

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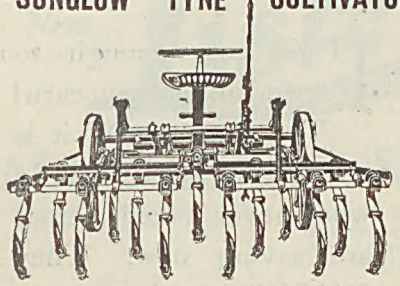

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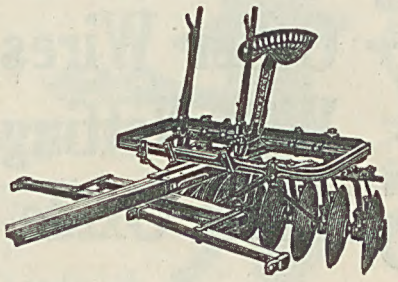

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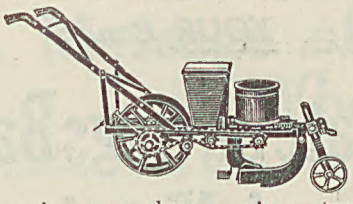

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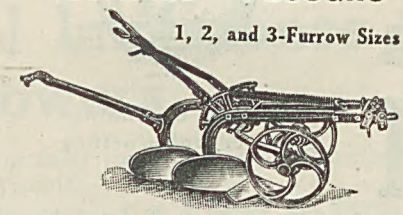

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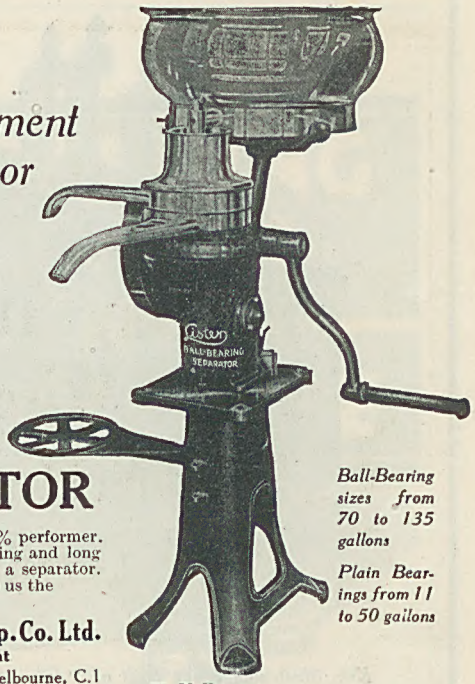

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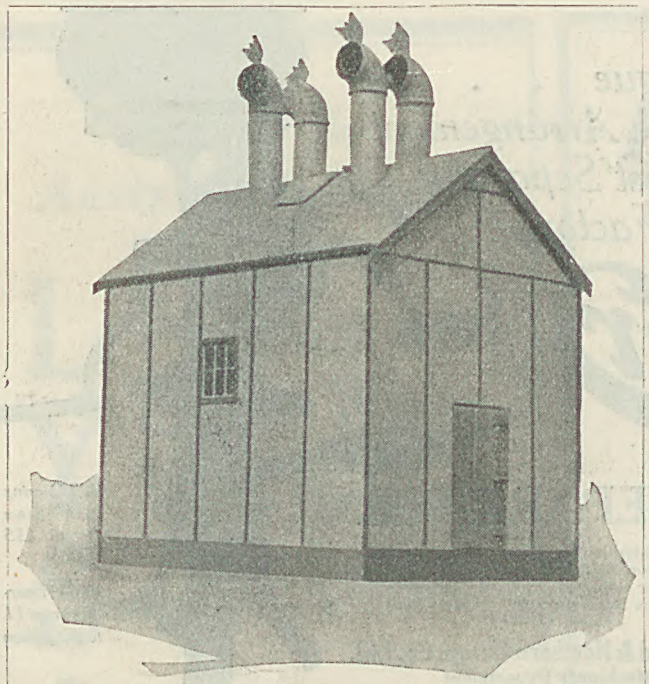

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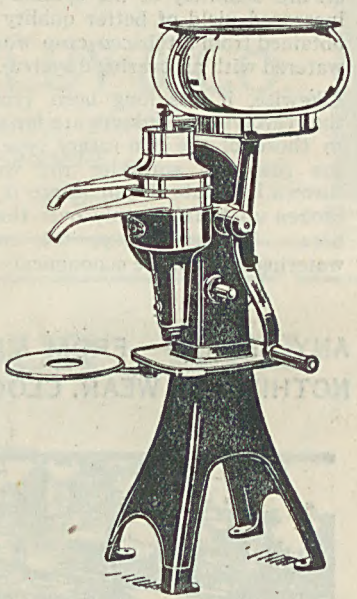

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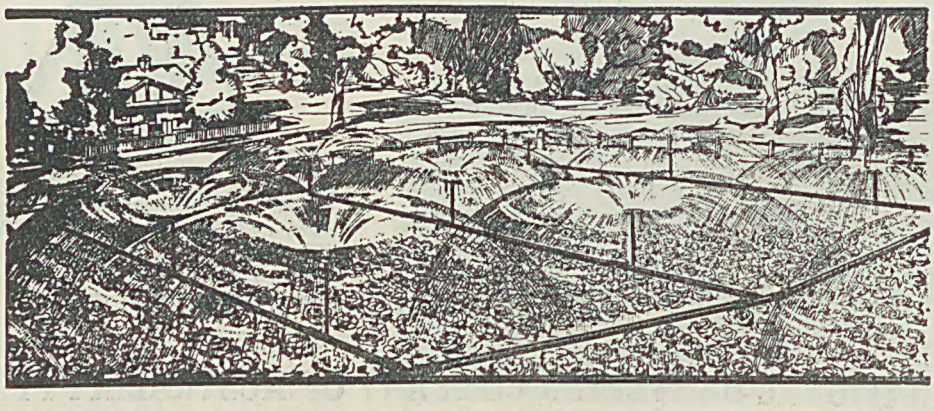

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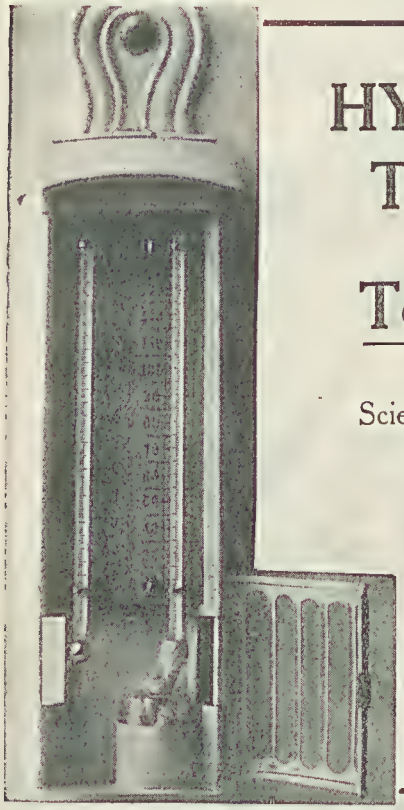

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The Journal of the DEPARTMENT of AGRICULTURE of VICTORIA

The Rye Grasses

SPECIES and TYPES

By F. R. Drake, B.Agr.Sc., Assistant Agrostologist.

ALL land-holders are familiar with the rye-grass family, and most Victorian farmers recognize and know the value of the three main members or species—Wimmera, Italian, and perennial, or English rye-grass. Few, however, realize the enormous diversity of types which exists, and of which each species is composed. Each species, whether Wimmera, Italian, or perennial rye-grass, is really an aggregate of a very large number of types, differing from each other in various features of agricultural and botanical significance. While many plants are found which it is difficult to place definitely in one or other of these species, an aggregate of plants of one kind is readily distinguished.

In addition to these three main species, there are two related species of rye-grass of considerably less importance, viz.:—Darnel or Drake (*Lolium temulentum*) and Rigid rye-grass (*Lolium rigidum*). Darnel is an annual weed in cereal crops, and is readily recognized from its very large and broad seeds, which are usually strongly awned, there being, however, an awnless variety. It has stiffly erect stems bearing a small number of yellowish green leaves. The seed of this grass contains a poison which makes its presence in large quantities dangerous. Rigid rye-grass is another annual species of little value, although it cannot be classed as a weed. It has short, thick stems bearing very little leaf. The ear is characteristically broad and deeply notched, and in these notches the spikelet, or group of flowers, is closely held by a long outer glume. It flowers and dies off much earlier than any of the other rye-grasses, and because of this and its almost leafless habit of growth it is of small value.

Wimmera Rye-Grass.

Wimmera rye-grass is an annual plant with certain very definite characteristics. Its origin is rather obscure, and has been the subject of much discussion and conjecture. It was first recognized as a distinct type, and public attention drawn to it, by Mr. H. A. Mullett, Agricultural Superintendent. It was described by him in the Victorian *Journal of Agriculture* for May, 1919, and from this article the following notes on its history are drawn:—"The earliest record of the grass, so far, is that furnished by Mr. R. Light, who states that there was an area of the grass on his farm at Noradjuha when he took possession of it 32 years ago. It had been planted there by a man named McNichol, the previous occupier, who had brought it from Europe."

Seed was harvested and supplied to many Mallee and Wimmera farmers, and on many

of their farms its spread was very rapid. Mr. H. McDougal, of Minyip, obtained a bag of seed from a Melbourne seed merchant, under the name of perennial rye-grass, which proved to be an annual, similar in type to the grass on Mr. Light's property, and the seed probably came from Noradjuha. This was sown on an area of 5 acres, and had by 1919 spread over an area of at least 3,000 acres. Mr. McDougal commenced harvesting seed, and this was at first sold to seed merchants as Italian rye-grass.

Since 1919 the use of this grass has spread to Western Australia, South Australia, and New South Wales, and large quantities of seed are being harvested in parts of the Western District of Victoria—notably around Dunkeld.

The typical Wimmera rye-grass of commerce is an earlier flowering plant than perennial rye, being much more stemmy and having larger and softer leaves. The stems usually show a marked degree of reddening, and in the late spring a field of Wimmera rye-grass has an unmistakable brownish red colour. It is a very free seeder, and it is this characteristic, together with the ability of the seeds to strike on the surface, that makes Wimmera rye-grass such a valuable plant in dry districts. The seeds are large —considerably larger than those of perennial rye—and usually with a slight brownish tinge. While some are awned, the majority are entirely awnless or only very slightly awned.

Provided it is sown under reasonably good conditions, Wimmera rye-grass establishes itself well from very light sowings of from 4 to 10 lb. per acre. It makes good winter growth, but will commence to come into ear in the early spring. After this stage has been reached it makes poor recovery after grazing. As soon as growth becomes stemmy new tillers are produced, not from the crown of the plant as in perennial rye, but from nodes on the stem above the ground, and if the plants are hard grazed, very few even of these tillers are produced. The plants must be spelled in the late spring in order to allow them to re-seed, but after they have seeded and died off they have considerable value as dry feed.

Early and late types of Wimmera rye grass are being developed in the grass selection plots at Burnley, but their production on a large scale has yet to be undertaken. A strain developed by Mr. Mullett, called the Rutherglen New Strain, has been distributed in small quantities for several years, and has given satisfaction on account of its later and leafier habit.

Typical Wimmera rye is a strictly annual plant, and, because of this fact and its habit of dying off rather early in the season, it should not be given a place in the wetter districts of Victoria. Its only virtue for these districts is its ability to make good winter growth, and this virtue is possessed to a greater degree by Italian rye-grass. Its usefulness in the dryer districts such as the wheat belt of Victoria is recognized by many, but its full value in increasing the sheep-carrying capacity of such areas has still to be fully appreciated.

Italian Rye-Grass.

Italian rye-grass (*Lolium italicum*) is generally described as a biennial, but in Victoria it is only under the best conditions that many plants survive into the second year, although some may establish themselves by re-seeding. Westernwolths rye is supposed to be a strictly annual variety of Italian rye, but there is no evidence to suggest that, at least as sold in Victoria, it differs in any way from Italian rye-grass.

Italian rye is a large, leafy, and vigorous plant, considerably later in coming into flower than Wimmera rye, and also definitely later than average perennial rye-grass. Thus the plant is able to recover from grazing much later in the season than Wimmera rye-grass, and may be expected to give a greater bulk of feed. The plants tend to be coarser than average Wimmera, but with a higher proportion of leaf to stem, the leaves being very long and broad. The ear is always strongly awned and the seed is large.

Italian rye-grass makes excellent winter growth—better even than Wimmera rye—and this characteristic, together with its lateness, renders it considerably more suitable than Wimmera rye-grass as an annual plant for grazing or for hay in districts of good rainfall as in southern Victoria. Provided seed were available at a reasonable price, this grass could be extensively and profitably used for providing "winter keep." Like most annuals,

Species of Rye-Grass.

1.—Rigid Rye-Grass; 2.—Drake or Darnel Grass; 3.—Wimmera Rye-Grass; 4.—Italian Rye-Grass; 5.—Perennial Rye-Grass.

it is a heavy seeder, and it should be possible to sell seed profitably for considerably less than the present price of 8s. to 10s. a bushel.

A small amount of Italian rye-grass frequently is included in permanent pasture mixtures for the purpose of providing early grazing. Its faculty of establishing rapidly from seed and growing well in the first winter make it valuable for this purpose, but if too much is sown, or if the plants are allowed to become too large, it is almost certain that many of the more important perennial plants will be overshadowed and crowded out and their chances of survival lessened. Its use in this connexion, except in a sparing manner, is therefore not to be encouraged.

Perennial Rye-Grass.

Perennial rye-grass (*Lolium perenne*) has long been recognized as one of the best grasses known for permanent pastures. There are many plants, such as Kentucky blue grass, which withstand grazing equally well but which have not the same capacity for production, and others, such as Cocksfoot, which are less resistant to close grazing.

In spite of the undoubted suitability of perennial rye-grass for permanent pastures, attempts to establish it by sowing down with commercial perennial rye-grass seed frequently fail. Such failures, indeed, have become so common that many farmers have come to take them almost as a matter of course. The common experience is for the rye-grass to establish and grow very well in the first season. Then follows a more or less rapid deterioration with a decrease in the number of plants present, their place being taken, as they disappear, by other and usually less desirable plants. In the higher rainfall areas of southern Victoria, particularly in Gippsland, there is never any lack of plants, of one type or another, to take the place of those that die, and even should the rye-grass plants be allowed to develop seed there will be little opportunity on account of lack of space and excessive competition for any seedlings to establish themselves.

The question naturally arises—How can one obtain seed which will give rise to truly perennial or long-lived plants? To be able to answer this question requires a knowledge of the sources from which the rye-grass seed sold in Victoria is obtained. A detailed investigation of the rye-grass problem is being carried out by the Agrostology Branch of the Department of Agriculture, but, apart from this, sufficient is already known to throw considerable light on the subject.

Much of the rye-grass seed used in Victoria is imported, the two chief exporting countries being New Zealand and the United Kingdom. Of the two, New Zealand probably supplies the larger proportion. Investigation has established clearly the fact that much of the rye-grass harvested in New Zealand is of a short lived or "false" perennial nature, while a small proportion of it is of an excellent and truly perennial type. As a result of this finding, a seed certification scheme has been instituted to preserve the identity of seed of truly perennial rye-grass in the ordinary channels of trade, and is now in operation in New Zealand. A full account of this investigation and of the initiation of

Perennial Italian and Wimmera Rye-Grass.

Note the dense leafy crown of the perennial rye compared with the open leafless crown of the Wimmera rye.

the certification scheme will be found in the *Journal of the New Zealand Department of Agriculture* for July and November, 1929, and June and September, 1930.

This New Zealand certified seed commands four or five times the price of uncertified seed, and those growers having fields of sufficiently good type will certainly have had them registered. It is obvious, therefore, that practically all the seed imported by merchants from New Zealand, and sold simply as New Zealand perennial rye-grass, will now be of a false perennial or short-lived type, unsuitable for use in any part of Victoria. The position in regard to the seed from the United Kingdom is at present less fully understood. Much of it is of a better type than the average New Zealand seed, but there is no doubt that some of it is of poor type.

The growing of rye-grass seed is an old established though not extensive industry in Victoria. The present condition of this industry is one of considerable interest. We have long been aware of the existence of an annual type of rye-grass (as distinct from Italian rye), which has been harvested and sold separately as Wimmera rye-grass. While most, if not all, of the New Zealand short-lived types are different from our Wimmera, the two are comparable in some respects, notably in their unsuitability for permanent pastures. It is safe to say that the early recognition in Victoria of the existence of annual and perennial types has lessened confusion in our internal rye-grass seed industry, compared with what apparently existed in New Zealand, before the introduction of the certification scheme.

Much of the Victorian seed is harvested from very old pastures of high quality, and which, on inspection, are found to consist almost wholly of perennial plants. Seed harvested from these old pastures will give rise to plants which are themselves, in the main, long-lived perennial plants. Unfortunately, however, this seed seldom retains its identity, but is usually mixed with other lots before being sold. Also, in the last year or two, a certain amount of Wimmera rye-grass has found its way on to the market as "Western District rye." Most old-established growers are able to dispose of their seed privately, and farmers purchasing seed direct from growers who harvest seed from old pastures almost invariably have good results. The internal position may be largely righted by a certification scheme for harvesting and selling seed from rye-grass pastures of proved age and perenniality. In order to supply reliable data for the inception of such a scheme in Victoria, a number of samples of rye-grass seed, collected from as many sources as possible, are being grown and critically examined at the Burnley Pasture Research Station. A full report of this work will be published shortly.

As the value of the true perennial type becomes more widely realized, it is probable that supplies will be inadequate and prices will rise. Unless we are to rely largely on supplies from other countries, it will be necessary to expand the seed industry in Victoria, and in order to extend our knowledge of the occurrence of our own good rye-grass pastures, those having old-established pastures are invited to send a small sample of seed, collected from such pastures, together with details as to the age and situation of the pasture, to the Agrostology Branch, Burnley Gardens, Burnley, E. 1, for trial in the Burnley plots.

Tobacco Growing

V.—Seed Selection, Harvesting and Curing

By W. J. B. McDonald, B.Agr.Sc., Assistant Inspector of Agriculture; and G. E. Coghlan, Tobacco Field Officer.

The first Article of this Series, which appeared in the August issue of the Journal, dealt with the soil and climatic conditions most suitable for Tobacco growing and the preparation of Seed beds. Subsequent Articles in the September, October, and November issues describe the methods of transplanting the seedlings, the work involved in the care of crops and the construction of flue curing barns.

Seed Selection.

EVERY tobacco-grower possessed of a crop true to type, free from disease, and exhibiting desirable characteristics, should endeavour to save and grow his own seed. It is a common belief among growers that the mere fact of growing seedlings in a district far removed from that in which they are to be planted out adds some particular vigour or merit to the seedling, and ensures a better stand after transplanting. There is no scientific or practical basis for this belief. Seedlings are raised away from the site on which they are to be matured for two very definite reasons—(1) to escape Blue Mould, and (2) to ensure earlier plants.

In districts free from Blue Mould, there is no advantage gained by importing seedlings from a distance unless it is impossible to raise them early enough to ensure satisfactory maturity. Except for the reasons above stated, the transport of seedlings is an unwarranted expense.

The selection of plants which it is desired should furnish seed should be made throughout the entire season. When topping an area, a number of plants in excess of actual seed requirements should be left intact and definitely located by some distinguishing feature. In the selection of these plants certain characteristics must be considered. The first essential is trueness to type. Vigorous growers, free from disease, finely ribbed and veined, with a generous web are features universally desired. The original selection of a large number of plants allows the culling out of any that later may exhibit undesirable features.

To prevent the cross pollination, to which the tobacco plant is very subject, the selected seed heads should be covered with a linen or cheese-cloth bag of sufficient size to allow their natural development. These should be examined regularly to allow removal of fallen blossoms and inspection for bud worm infection. Suckers should be cleaned off, and all but the main body leaves removed.

Seed head bagged to prevent cross pollination.

A field of ripe tobacco leaf.

After the major portion of the pods have turned brown the cover can be removed. Any pods still holding blossoms must be pinched off. After the pods have fully developed, the whole head is harvested on the stalk and hung under cover to dry. Attacks from mice and rats must be provided against.

Harvesting.

The successful tobacco-grower must be able to recognize the signs indicating the stage at which the plant is ready for harvest. This precise knowledge is gained only after experience and a certain amount of local experimentation, but most advanced growers agree on certain characteristic changes in the leaf that accompany ripening. These are as follow:—

The leaf acquires a lightening in colour with characteristic yellow spotting, the surface developing a roughness and gumminess to the touch. At the same time, the leaf as a whole assumes a drooping habit, and on folding or pinching the web cracks cleanly. The first ripe leaves may be expected 35 to 40 days after topping. Dr. Garner, in his bulletin on Principles and Practical Methods of Curing, describes the ripening of the leaf as follows:—

"When the reserve food supply of the mature leaf is no longer required for the nourishment of the other parts of the plant, it is deposited in the leaf tissue in the form of starch granules, while the green colouring matters are dissolved and carried to the younger growing parts. This interchange causes the appearance of the light-tinted flecks so characteristic of the appearance of the ripe leaf. Moreover, the accumulation of the starch granules in the leaf causes it to become brittle so that it snaps when folded between the fingers."

Tobacco must be ripe when harvested, although leaf that is allowed to become over-ripe loses weight, elasticity, and soundness. The tendency of leaves when ripening is to increase in weight by the accumulation of mineral matters and through certain cell transformations by which the cell wall becomes thickened and the percentage of water is somewhat reduced.

On the other hand, if picked too green, it will be sound, but will lack body and weight and never exhibit the clear colour or full flavour of leaf ripened in the natural fashion.

The ripening period will extend normally over three to four weeks, the bottom and heavier-bodied leaves ripening first. The remaining leaves ripen according to their position on the stalk—the topmost leaves being the last to mature. It is not desirable to harvest the tobacco for two or three days after heavy rain, as the gum which accumulates on the leaf in dry weather and improves its quality is washed off. Wherever practicable, harvesting should not proceed while the leaves are in a dewy condition. The earlier part of the morning could be utilized profitably by suckering and attending to insect pests and their larvae. Where harvesting operations extend so far into the season that there is a danger of frosting, any operation delaying the rapidity of harvesting must be neglected, as a heavy frost on the mature leaf results in a total loss of the leaves so affected.

Curing difficulties can be modified somewhat by the degree of care expended in harvesting. All leaf picked should be, as far as possible, of similar character as regards texture and ripeness. This is the first step in obtaining a uniform "cure." Leaves of varying texture

and maturity cannot be cured by means of the same formulae—unripe leaf taking much longer to "colour" than ripe leaf. If catering for the ripe leaf, the unripe leaf would commence to dry out before reaching the requisite colour; or, on the other hand, if the barn were kept in the condition necessary to ensure colour in the unripe leaf, the more mature tobacco would be in danger of "sponging."

To obtain the best results, the leaf picked and hung on any one day should completely fill the barn. Troubles arising from picking on two separate days are due to the fact that leaf harvested on the first day commences the cure proper with a very different moisture content from that picked on the second.

Priming.

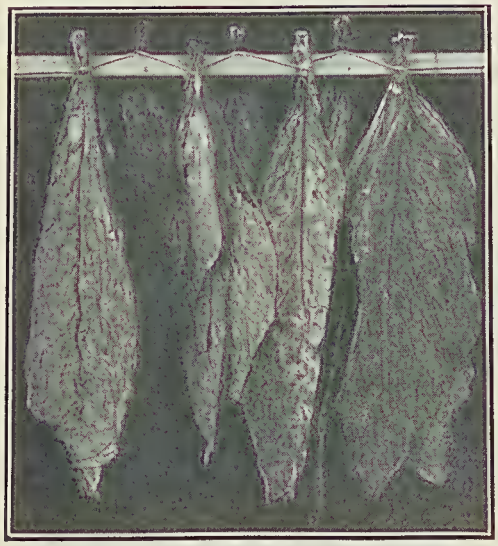
In Victoria the accepted method of harvesting leaf is that known as priming as distinct from harvesting by the stalk method, in which the whole plant is cut off at ground level, split down the centre of the stalk, and forked over the hang sticks. Experience has demonstrated that for local conditions, priming is the better method. The actual equipment required for harvesting is not expensive, but the grower will be well repaid by having on hand an adequate supply of the necessary materials, which consist of strips of hessian or bags, in which to transport the picked leaf and binder twine for tying. A low-bodied lorry is the most convenient vehicle on which to transport the tobacco to the curing barn.

Filling a 16 ft. x 16 ft. barn in one day will require the united efforts of six experienced hands. The individual leaves are broken from the stalk and placed so that the butts all point in the one direction. These are carried in the crook of the arm until the bundle becomes inconveniently large, when it is placed on the previously-mentioned hessian sheet, which is laid flat between the rows. When full the sheet is left open for a short period until a slight wilting of the leaves occurs. Leaves so wilted lose a certain amount of brittleness, and suffer less damage and cracking when the two ends of the sheet are hooked or tied together prior to lifting on to the lorry.

In collecting the leaf over-filling of either the arm or the hessian sheet should be avoided, as the leaf is particularly liable to injury through cracking and bruising. This can be caused either through pressure of the leaf against the chest of the picker or by kneeling on the hessian in stretching it over an unduly large bulk of leaf. Undue exposure of the picked leaf to the direct rays of the sun for any length of time results in sunburn. Freshly-picked leaf should not be stored in other than thin layers. If left tied in the bags or piled in heaps over-night, it is liable to heat very quickly. Where but limited labour is available, the general procedure is to pick in the morning and tie and hang the leaf in the afternoon.

The correct and incorrect methods of handing leaf to the "stringer." The correct method is shown on the right. The left illustration shows the hand too far down the leaf.

For stringing the tobacco, a bench at any convenient height is erected outside the curing barn, a sheet of corrugated iron being suitable for this purpose. Some convenient rack for holding the hang sticks must be constructed close to the bench. In stringing, two to four leaves are taken in one hand, holding them loosely 4 to 5 inches below the butts, which are placed against the stick with about 1½ inches projecting above the top. The tie



Portion of "hang" stick showing method of stringing.

string, which previously has been firmly attached to one end of the stick, is looped round the butts flush with the stick and with just sufficient tension to hold the leaves in position. The string is then carried diagonally across the stick to a bundle of leaves similarly arranged on the opposite side, but 2 inches to 3 inches distant from the first bundle and looped round the butts as in the first instance. This process is repeated until the stick is filled, 23 to 25 bundles being a sufficient load for one stick. The string is then tied firmly at the opposite end of the stick. After a little practice, one man on the string will keep two men arranging and "handing" the bundles. The men handing the leaves should hold them by the extreme tip of the butt so that the man on the string can easily grasp the bundle at the most convenient point. Where time and labour permit, it is an advantage to arrange the leaves face to face. This tends to prevent undue curling. When full the sticks are placed about 6 to 8 inches apart on the tier beams. If handling very heavy leaf this distance should be somewhat increased. Sticks should not be crowded in the barn.

Curing.

For a proper appreciation of the art of curing, it is necessary to realize that curing is not merely a drying process, but essentially a life function involving many complex changes. For the purpose of the present discussion, curing is regarded as those changes taking place within the barn, and not including the fermentation or sweating occurring after the leaf is bulked down. The after fermentation is concerned with dead tissue, and as such is fundamentally different from the curing process. Many growers have noted the improvement which occurs when leaf poorly cured has been bulked down for long periods. It is quite obvious that during the ageing period some chemical changes have gone on within the leaf tissue, but as has been shown by Dr. Garner these are subsequent or complementary to those changes occurring in the barn and are not a continuation of the curing process. Fermentation, even under perfectly controlled conditions, will not overcome defects due to faulty curing.

From a short consideration of the problem, it will be readily understood that curing is a starvation process. Respiration and consumption of food are just as much a feature of plant life as of animal life. During the life of the leaf, after picking, it is deprived of the soil solution from which the life-giving elements are derived and protected from the sun, whose influence is essential to plant food elaboration. Its continued existence, therefore, is necessarily at the expense of some of the plant food stored within the leaf cell; the degree to which starvation proceeds depending on the rate and method of curing. Respiration is continued in much the same manner as is normal to the living plant.

For the nourishment of the growing portions of the plant, soluble plant foods are continually being transported from the leaf cells to the growing tip. In the dying leaf web much the same type of process occurs, involving a partial breakdown of the cell constituents and their translocation through the veins and midrib to the stalk.

When tobacco is harvested according to the priming method, translocation cannot exert such a pronounced influence on curing changes as when leaf is harvested on the stalk.

Apart from the loss of weight, due to the drying out of the water in the leaf, there is quite an appreciable loss of dry matter during the curing process. In stalk curing this loss may reach as high as from 35 per cent. to 40 per cent., the loss being due to the combined influences of respiration and translocation. In curing the picked leaves the loss is about half of that holding for the same class of

tobacco stalk cured and is largely due to losses occurring through respiration.

Fundamental chemical changes due to curing involve a complete disappearance of starch from the leaf tissue, a considerable reduction in the content of the reducing sugars and the elimination of a large percentage of the nitrogenous compounds.

The afore-mentioned changes materially affect certain of the physical properties of the leaf, particularly the fire-holding capacity, colour, texture, and elasticity. Aroma is not developed in the barn, but its subsequent development is probably influenced by the manner of curing.

Barn curing has been attempted largely according to "rule of thumb" methods, without due respect to the variation in procedure necessitated by differing environmental and climatic conditions. The experienced and observant curer cannot have failed to realize the influence that soil, climate, and variety exert in effecting a satisfactory cure. Consequently, before the individual grower makes much progress in the art of curing, he must realize that a curing formula is necessarily a very flexible proceeding, which must be modified to suit the varying uncontrolled conditions encountered.

The most valuable class of leaf is that which can be cured to a bright lemon colour. This is much easier to obtain off light sandy soils than from heavy loams or soils rich in organic matter. Fine textured, light bodied varieties like Hickory Pryor and Yellow Pryor are easier to cure, and give a much higher percentage of "lemon" leaf than do heavier varieties such as Lacks, P. K., and Blue Pryor. Where a light and heavy-bodied leaf are placed in the barn together it is impossible to cure the one satisfactorily without to some extent sacrificing the other. Wet weather during the ripening period causes a further rise of sap in the plant, which detracts from the clarity of colour in the cured product.

The curing process is naturally divided into three distinct phases, each representing equally important steps in the satisfactory completion of the cure. Many barns full of leaf have been ruined by temporary neglect during one of these periods.

They are descriptively known as—

(i) Yellowing the leaf.
(ii) Fixing the colour.
(iii) Drying out.

1. *Yellowing the Leaf.*

Before commencing the actual cure, the barn should be adequately equipped with a series of tested thermometers of such a nature that they may be read easily at a distance. Coloured spirit thermometers, graduated according to the Fahrenheit scale, are the most suitable. At least two, but preferably three or four, should be distributed uniformly throughout the barn. In addition, a wet and dry bulb thermometer, necessary to the determination of the degree of humidity, is absolutely essential.

Immediately the barn is completely full, which, as previously indicated, should be done in one day, the fires should be lit and the temperature raised gradually to 90° F., and held in that condition. If the temperature within the barn, due to atmospheric conditions, is 90° or more, there is no occasion to light the fires until they become necessary to maintain this degree of heat. During the yellowing period all ventilators should be tightly closed, the object being to maintain a saturated atmosphere within the barn. Should the moisture given off by the leaf be allowed to escape, "drying out" would commence before the leaf had coloured satisfactorily.

According to the amount of moisture present in the leaf at the commencement of the cure, water may have to be artificially introduced into the barn to bring the atmosphere to the desired humidity. If the wet bulb thermometer is more than 2° F. less than the dry bulb it will be necessary to introduce moisture. At least one hour after reaching the temperature of 90° should be allowed to elapse before making this determination. There are several methods of introducing moisture. One method, not recommended, consists in spraying the floor and walls with water. A better way entails the placing of wet bags over the hot flues, but in this instance care must be taken to see that the bags do not completely dry out and catch fire. A still better method consists of introducing flat vessels of boiling water which, placed on the flues, keep boiling and disseminating steam throughout the building. If during this phase the tip of the leaf shows any tendency to curl upwards and become brittle, it is quite evident that the atmosphere is not sufficiently saturated. The time required for yellowing varies enormously, according to the barn, the district, the maturity, and

texture of the leaf. For instance, in the north-eastern district the time taken in curing is from 40 per cent. to 50 per cent. greater than at Pomonal.

The conditions holding in the barn during this period are particularly favorable to rapid physiological activity, resulting in an acceleration of the normal ripening process, which manifests itself by a change in colour from mottled green to yellow, owing to the breaking down of the chlorophyll or green colouring matter. The stage at which the ventilators are "cracked," that is slightly opened and the temperature is raised, is determined according to the degree of colour in the leaf. Colour should never be estimated in artificial light nor by viewing the leaf between the light and the observer. The bottom tiered leaves and those adjacent to the door are not a fair sample of the leaf holding throughout the bulk of the barn, and any examination should not be confined to these portions.

The experienced curer commences the second phase of the cure before the leaf has reached the full yellow colour, as he is able to judge to what extent the colouring will proceed into the next stage, but the inexperienced grower is advised to obtain a fairly full colour before he commences to open the barn. The first indication of the yellowing process having gone too far is a brown discoloration of the leaf, commonly known as sponging. This is corrected by greater ventilation. Sponging can also be caused much earlier in the cure by cold air leaks due to faulty barn construction. A preliminary to sponging is condensation of moisture on the leaf surface. The proportion of sponged leaf in a barn will depend largely on the degree of care expended in picking a uniform sample of leaf.

With wood fires it will be found very difficult to hold the barn at a constantly uniform temperature, but a range of 5° F. should not be exceeded. This is well within the capability of the careful firer. From 10 to 15 minutes after every addition of fuel the thermometers should be read to ascertain the effect on barn temperature. Firing must be attended to for 24 hours in every day throughout the curing period.

2. *Fixing the Colour.*

The second phase involves a careful manipulation of temperature and ventilation. Having reached the desired colour, a lemon yellow, the top ventilators are cracked and the temperature gradually raised to 95° F. By opening the top ventilators about two hours before the bottom ones, any leaf that has reached the desired colour commences to dry out, but at the same time drying is not sufficiently rapid to prevent further colouring of leaf still slightly green.

Fixing the colour involves the drying out of the leaf web, which results in the slow death of the leaf tissue, thus preventing any further change due to the life processes of the cell itself.

The amount of heat and ventilation applied depend on the reaction of the leaf to the changed conditions. Drying is signified by the curling of the leaf tip and the gradual drying of the leaf web from the outer portions of the leaf towards the midrib. As the proportion of dried web increases so can the temperature be raised and ventilation increased. While the atmosphere within the barn remains in a saturated condition drying out cannot take place. Moisture is removed from the leaf by the circulating air, and if this were to remain fully charged with water vapour it would not be capable of picking up and removing that given off by the leaf. The rate of drying depends then on the condition of the air entering the barn, the rate of movement and the temperature within the barn. If external atmospheric conditions were very humid, it would be necessary to provide for greater ventilation to effect the same amount of drying than would be the case with very dry air.

With the temperature approaching 95° F. the bottom ventilators are slightly opened, the opening at the top being gradually increased with the rise in temperature of the barn. With the barn at 95° F. the top vents should show an opening of about 2 inches. If there should be any evidence of sponging the rate of ventilation must be increased, and the temperature slightly raised to accelerate the removal of the moisture.

Having commenced pushing the temperature of the barn upwards, it is essential that there should be no sustained drop in the readings. The barn can be held at 95° F. for from three to four hours. The temperature, as nearly as possible at the rate of one degree per hour, should now be raised to 100°F., and held for five or six hours. If the temperature be raised too rapidly a reddening of the lower tiers of leaves is caused by scalding.

The temperature is carried in a further five hours to 110°, and held between 110° and 115° for ten hours. At this stage the difference in readings between the wet and dry bulb thermometer should be 7° or 8°. If necessary, this can be obtained by increasing the ventilation.

At the expiration of this time the temperature is raised over a period of about fifteen hours to 130° F., and held at this temperature for from ten to twelve hours, the difference in wet and dry bulb readings being 12–15° F. By this time the web and veins of the leaf should be practically dry, and the colour should have reached a stable condition.

3. *Drying Out.*

The third phase of the cure is now reached. This involves the complete drying out of the veins and midrib. Over a period of 24 hours the temperature is raised to between 170° and 180° F., and held in this condition for about fourteen hours. To facilitate the rise in temperature the ventilators are progressively closed as the temperature increases until ultimately the top vent is just "cracked." This high temperature must be held until the butt of the midrib is sufficiently dry and brittle to snap when bent between the fingers. The temperature should never exceed 180° F. When the ribs are sufficiently dry the fires should be drawn and the barn allowed to cool.

As has been pointed out previously, hard and fast rules cannot be applied to successful tobacco curing. It is hoped the following hints will enable the amateur to modify successfully the general scheme indicated above:—

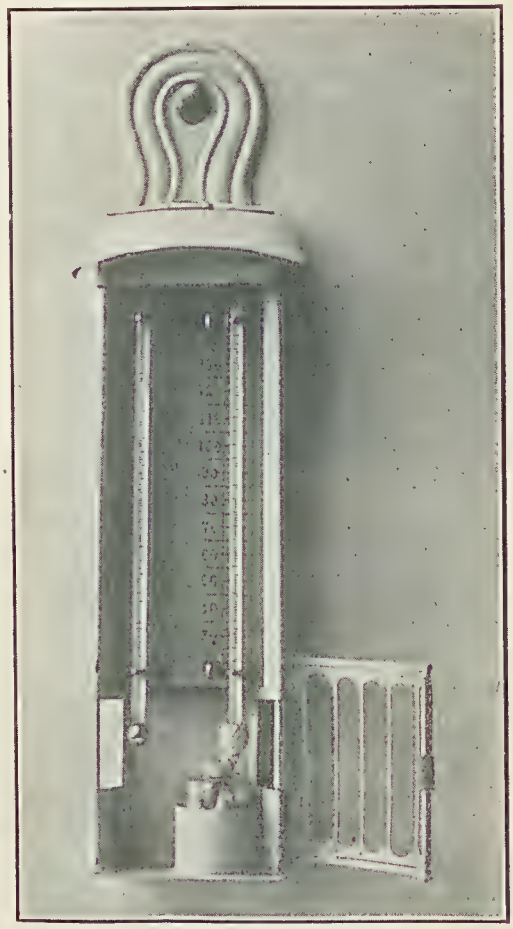
(1) Sponging is due to the accumulation of moisture on the leaf surface, and is corrected by increased ventilation.

(2) Scalding is due to a too rapid rise in temperature, and is manifested by a reddish discoloration of the leaf web. The temperature can be lowered by a temporary acceleration of the ventilation.

(3) To obtain greater differences between the readings of the wet and dry bulb thermometers increase the rate of ventilation.

(4) The presence of any foul or unpleasant odour within the barn indicates the necessity for increased ventilation.

(5) Late maturing crops should be yellowed at lower temperatures.



A wet and dry bulb thermometer.

(6) In cool, dry weather use lower temperatures.

(7) In damp weather ventilate earlier and more rapidly.

(8) If the outside atmosphere is very dry, it is possible to use lower temperatures and less ventilation.

(9) Overripe leaf should be dried rapidly, with little, if any, yellowing period.

(10) If leaf is drying too quickly, decrease temperature and ventilation.

(11) Do not decrease ventilation with a view to raising temperature except in the last phase of the cure.

(12) Fires should glow rather than blaze.

(13) Open the door of the barn only when unavoidable.

Curing Heavy Leaf.

In many instances tobacco grown on rich or heavy soils cannot be cured to a lemon

colour, but goes directly from green to a mottled brown. In such cases a mahogany coloured leaf is the best that can be expected. In this instance we cannot do better than quote the formula evolved by Mr. G. E. Marks for curing this type of leaf:—

"Start the fires as soon as the barn is full, and proceed as with other types by raising the temperature to about 80° to 90°, and let it remain without ventilation at this degree from 12 to 36 hours. During this period the atmosphere must be kept moist, as in the case of yellow tobacco, with from 2° to 4° difference between the wet and dry bulb thermometers. After, say, eighteen hours, the leaf will have changed to a lighter shade of green, and at this stage the vents, both in the roof and at ground level, should be opened about 2 inches. The heat should be retained at 95° until the leaf has attained about a half yellow or mottled colour, when the top vents should be opened to give about 16 square feet and the bottom vents 8 square feet of ventilating space. The temperature should then be gradually raised to 110° F. at the rate of 1° per hour and kept at 110° F. until the leaf is about half dry, when the temperature should be raised to 120° F. at the rate of 2° per hour. It should remain at 120° until the web of the leaf is all dry except a strip along the veins and midribs, when the temperature may be raised to 125° F., and left at this point for a few hours to complete the drying of the web. It should then be increased at the rate of 5° per hour until 180° is reached, and kept at this until the midribs are thoroughly dried out. In curing heavy tobacco careful attention should be paid to the first stages of the process. The earlier the yellow colour appears on the leaf, the sooner the vents will require opening, and as the yellow colour increases, so the ventilation will have to be increased. The drying and curing go on simultaneously, therefore some experience and practice is needed to just finish drying the web by the time the best colour is obtained, which is usually from bright to dark mahogany."

Wet and Dry Bulb Thermometers.

The dry bulb and wet bulb thermometers are used chiefly for determining the atmospheric humidity. The dry bulb indicates the temperature at the moment it is read, and should not be handled unnecessarily. The wet bulb usually reads lower than the dry bulb, because it is affected by the evaporation of the moisture around the bulb. From the difference between the readings of these two thermometers the humidity may be determined. The greater the difference for similar temperature ranges the drier the atmosphere.

A wet bulb thermometer can be constructed easily on the farm by tieing a piece of muslin firmly round the bulb of the thermometer and keeping it moist by feeding with a wick, one end of which is immersed in a small vessel of water. The vessel should be kept moderately full of water, and the muslin should be renewed when soiled.

Removal of Arsenical Spray Residue from Apples

By A. G. Strickland, M.Agr.Sc., Horticultural Research Officer.

THE use of lead arsenate sprays for Codling moth control has been standard orchard practice in Victoria for many years, and the unsightly residue of arsenic remaining on sprayed fruit at picking time has always been a problem of some importance. The substitution of one or more oil sprays for some of the arsenical applications, and the use of combined arsenic and oil sprays, in recent years has intensified the problem, owing to the binding and weather-proofing action of the oil. In cases where arsenic-oil sprays have been used, it is impossible to remove the residue, even by hand-wiping of individual fruits.

The British health authorities have fixed a legal limit to the quantity of arsenic which any foodstuff may contain, and persons offering for sale any foodstuff, 1 lb. of which contains more than 0.01 grain of arsenious trioxide (As_2O_3), are liable to prosecution. From time to time complaints have been received from Great Britain, that apples imported from Australia contain more than the legal minimum of arsenic, and show visible spray deposit.

Such complaints must adversely affect the market for our apples, and it is therefore necessary for our export fruit not only to comply with the legal standard, but also to be absolutely free from any white stain which may prejudice the purchaser.

In some quarters it is questioned whether the quantity of arsenic remaining on sprayed fruit could be harmful to the consumer, but authorities state that even very small amounts of arsenic over extended periods of time may be injurious, and that the lead generally used in combination with the arsenic may be even more dangerous. The fact remains that, even though fruit be below the statutory limit in its arsenic content, the presence of visible spray stain will prejudice the buyer.

Hand-wiping has been resorted to as a means of removing spray residue, but even under the best of conditions it is ineffective. It is impossible to remove residue from the ends of the fruit by this means, and the method is quite inadequate where oil sprays have been used. Perhaps the chief objection, however, is the time and labour involved in hand-wiping, and it is certain that a cheaper method is desirable.

The cleansing of fruit by chemical washing has been generally adopted in the United States of America and other countries, and the most successful wash consists of hydrochloric acid at a strength of ½ to 1 per cent. Such a solution will remove up to 90 per cent. of the residue, and where the method is properly carried out no injury to fruit need be caused.

During the 1930-31 fruit season a test to determine the efficacy of the hydrochloric acid treatment was made at Harcourt (Vic.). Four cases of apples, heavily coated with arsenical residue, were used, the treatment being as follow:—

Case No. 1.—No treatment.

Case No. 2.—Dipped in water 3 min. and hand-wiped.

Case No. 3.—Dipped in 1 per cent. hydrochloric acid for 2 min.

Case No. 4.—Dipped in ½ per cent. hydrochloric acid for 3 min.

A wooden cask was employed to contain the acid, and treatment was carried out by the immersion of a partly filled case of fruit in the solution. A top was lightly attached to the case of fruit in order to prevent the apples from floating out, and the case plunged up and down in the acid bath. After immersion in the acid, the cased fruit was allowed to drain for a few minutes, and then transferred to another cask of clean water for rinsing. Rinsing after acid treatment must be carried out thoroughly, otherwise injury to the fruit will result.

Effect on Arsenical Residue of washing in 1 per cent. and ½ per cent. Hydrochloric Acid.

Samples of untreated and washed fruit were submitted to the Agricultural Research Chemist for analysis, the results of which are given in Table I.:—

TABLE I.

Treatment.	Grains per lb. of Fruit.	
	Arsenic.	As_2O_3.
1. Untreated	0.043	0.057
2. Washed with water and hand-wiped	0.011	0.015
3. Washed with ½ per cent. Hydrochloric acid for three minutes	0.0018	0.0024
4. Washed with 1 per cent. Hydrochloric acid for two minutes	0.0018	0.0024

It will be noted from Table I. that the fruit used in this test contained 0.057 grains of As_2O_3 per lb., i.e., nearly six times the legal limit. Washing with water, and wiping with a cloth reduced the arsenic content to 0.015 grains per lb., but this quantity is still in excess of the British tolerance. Washing with both ½ per cent. and 1 per cent. hydrochloric acid reduced the arsenic content to approximately one-quarter of the quantity allowed by law.

Storage Tests on Treated Fruit.

Acid treatment when properly carried out results in no serious injury to the fruit, and on the contrary will often add to the attractiveness, especially when the crop is heavily coated with spray residue. Where insufficient attention is paid to rinsing the fruit after acid treatment, serious injury may occur. There is no danger of acid-contaminated fruit reaching the consumer, as hydrochloric acid is volatile, and quickly disappears during storage where rinsing has not been thoroughly

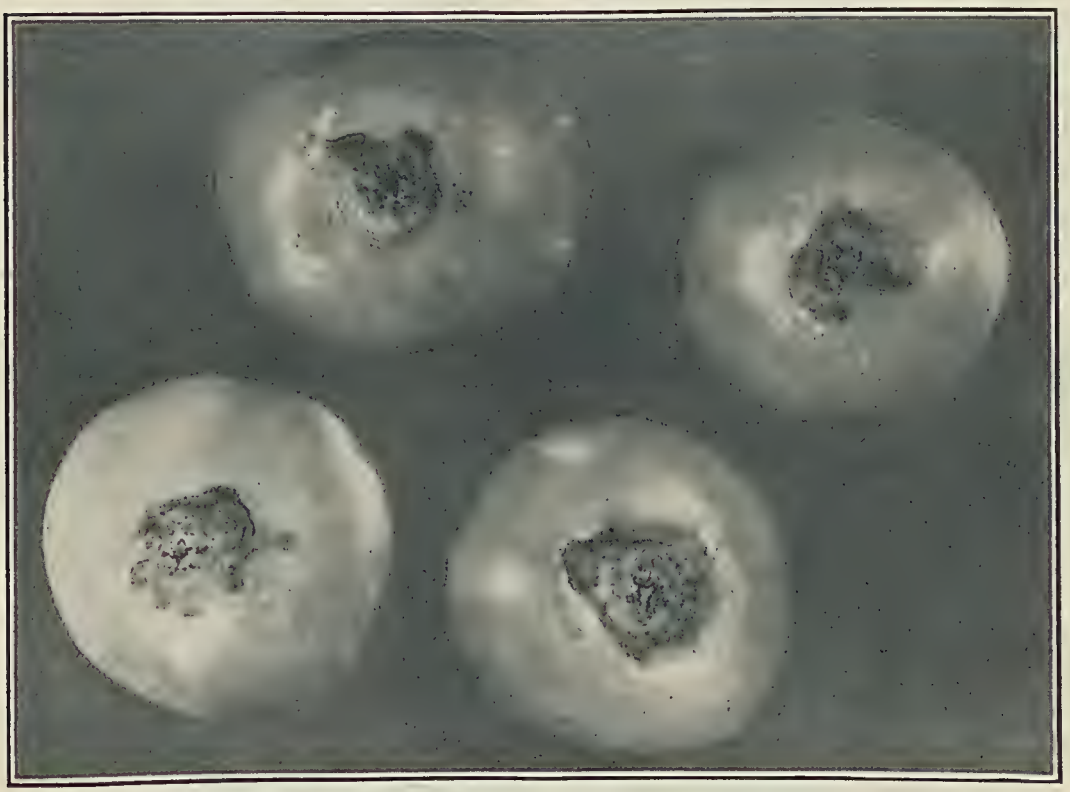


Fig. 1.—Typical calyx injury due to incomplete washing.

carried out. However, any excess acid left on the fruit will collect in the calyx and stem cavities, and although it will ultimately evaporate, it may persist long enough to injure the fruit. The injury usually appears as a bleaching of the skin, and formation of depressed areas; if arsenic is present, these spots turn black. This type of injury, which most often occurs at the calyx end, is shown in Fig. 1.

Effective rinsing will preclude any possibility of the trouble, and the most reliable guide to rinsing is the tongue. If the tip of the tongue be applied to the calyx end of the rinsed fruit, any residual acid will be readily detected by a sharp stinging sensation.

In certain cases damage may be caused by penetration of the acid wash through open calyx tubes, but this problem is encountered only where the apples are deeply submerged in the acid bath. Where varieties such as Jonathan and Delicious are being treated, care should be taken not to submerge them too deeply.

Storage rots may be somewhat more prevalent in washed fruit, owing to bruising of the fruit during handling, and the concentration of mould spores in the washing solution. The trouble may be avoided by careful handling of the fruit, and frequent change of the wash water. In the test at Harcourt, the fruit was placed in cool store immediately after treatment. Examination after one month showed the development of a certain amount of calyx injury (see Fig. 1) in the acid-treated fruit. This was not unexpected, as rinsing facilities were insufficient, owing to a failure of the water supply whilst the test was being carried out. In most cases the injury was comparatively slight, the illustration depicting some of the most badly affected specimens.

After a period of five months in cool storage, the fruit was thoroughly examined. Apart from calyx injury there was little or no difference in the appearance and quality of treated and untreated fruit. Fungal decay was more prevalent in fruit which had been immersed in water or acid; but in no case was it of serious consequence. Untreated fruit was superior, in that there was no calyx injury or fungal decay, but its general appearance was inferior owing to the presence of visible spray residue. Results of the detailed count are shown in Table II.

TABLE II.

Treatment.	Fungal Decay.	Calyx Injury.
Untreated	Nil	Nil
Washed in water ..	6 per cent.	Nil
Washed in ½ per cent. Hydrochloric acid	6 per cent.	32 per cent.*
Washed in 1 per cent. Hydrochloric acid	8 per cent.	41 per cent.*

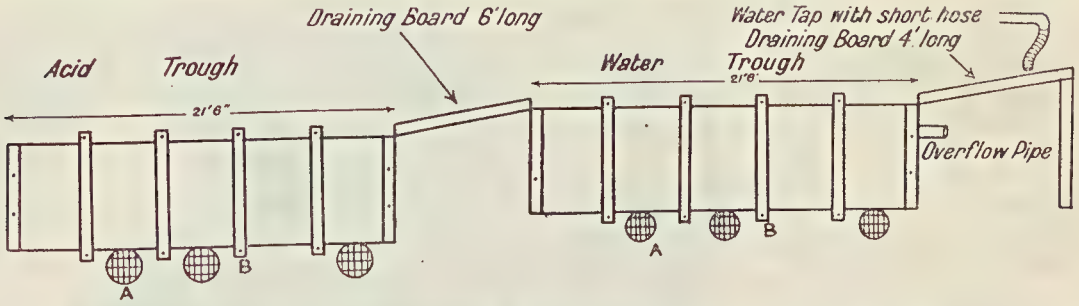
* High percentage of calyx injury due to failure of water supply and consequent rinsing facilities.

Practical Application.

The results of the test indicate the value of this method in removal of spray residue, and it is hoped that growers and packing sheds will give the method a trial during the forthcoming export season.

In the United States of America machines have been developed for this process. One type sprays the fruit with hydrochloric acid solution as it passes through the spray chamber, rinsing the fruit later with clear water, and drying it with a forced draught of air. Another type floats the fruit directly through the solution, spraying from overhead nozzles at the same time.

For the average grower and smaller packing sheds, no such elaborate equipment is necessary, the main requisite being a plentiful supply of water. Two wooden casks may be used, one for the acid solution, and the other for rinsing; casks are obtainable which will accommodate comfortably a case of fruit. If possible, a continuous stream of water should run through the rinsing bath, or if this cannot be done, the rinse water should be changed frequently. It is computed that 2 to 3 gallons of water is necessary for each bushel of fruit to be rinsed, but even more than this quantity could be used with advantage. The acid bath will gradually lose strength, and will eventually require replenishing. Authorities state that the acid solution should be changed after treatment of about 1,000 bushels of fruit per 100 gallons of solution. One gallon of commercial hydrochloric acid (33 per cent.) in 64 gallons of water will give a 1 per cent. solution. The cased fruit should be plunged up and down in this solution for one to two minutes, drained for a few minutes, and then rinsed thoroughly in clean running water. The



A.—Transverse log or plank to raise trough from ground.
B.—Batten to strengthen trough. One transverse bolt connects the batten of one side with that of the opposite side of the trough both at the top and at the bottom.

Fig. 2.—Large troughs for dipping 15 cases of fruit simultaneously.

rinsing is best completed by directing a jet of water on to the fruit in the case.

A simple equipment for dealing with larger quantities of fruit is described in Bulletin 63 of the South African Department of Agriculture, and consists essentially of two wooden troughs, one for holding acid solution and the other for water. The two troughs are placed end to end with one sloping draining board between them, and another at the end of the water trough. (See Fig. 2). The troughs are a little wider than the length of the fruit boxes in which the fruit is to be dipped, about 20 inches deep, and about 12 inches longer than the combined length of the boxes, placed side by side, which it is desired to dip simultaneously. The boxes of fruit are floated through the acid trough, on to the central draining board, through the rinsing trough (which has a continuous flow of water running through it), and are finally drenched with a hose whilst on the end draining board.

Complete drying of the fruit does not seem to be necessary, and if each fruit is given a quick single shake before wrapping and packing, the wrapping paper will readily absorb any residual moisture.

Where there is a limited supply of water for rinsing purposes, the fruit should be dipped for half a minute in a third trough containing water, to which slaked lime has been added at the rate of 2 lb. to 80 gallons of water. The purpose of this third bath is to neutralize any residual acid. No further rinsing should follow the treatment in lime water. In all cases, fruit should be submitted to the acid treatment immediately after picking, otherwise wax develops on the skin and impedes the solvent action of the acid.

It is considered that this treatment can be applied advantageously by many growers, and will prove far less costly and more effective than hand-wiping. The Victorian Department of Agriculture will be glad to co-operate with growers or packing sheds desirous of giving the method a trial, and to supply further details which it has not been possible to include in this article.

An Experimental Shipment of Navel Oranges to Canada

W. J. Young, Associate-Professor of Bio-chemistry, Melbourne University, and Frank M. Read, M. Agr.Sc., Senior Horticultural Research Officer, Department of Agriculture, Victoria.

IN June, 1931, when a trial shipment of navel oranges was exported from Australia to Canada, the Citrus Preservation Committee of the Council for Scientific and Industrial Research was given an opportunity of conducting an experiment to ascertain the effects of treatment with sodium bicarbonate and paraffin, and of two types of wrapping paper, upon the keeping qualities of a quantity of the fruit shipped.

Arrangements were made with the Canadian Department of Agriculture for the experimental fruit to be examined carefully on arrival, and the thanks of the Committee are due to Messrs. Leonard S. McLaine, Chief of the Division of Foreign Pests Suppression, to H. T. Güssow, Dominion Botanist, for making the necessary arrangements, and to Messrs. F. L. Drayton, Plant Pathologist, W. Ferguson, and W. St. G. Ryan, Departmental Inspectors, for carrying out the actual inspection of the fruit. Thanks are due also to the staff and officers of the Canadian National Steamships Company, who gave every assistance to the Committee.

Treatment Before Shipment.

The fruit was obtained from two districts on the River Murray — Merbein and Curlwaa—and was picked and handled with the greatest care according to the recommendations for the treatment of fruit for export recently issued by the Committee.[1]

The fruit from Curlwaa was sent directly to Melbourne without any sweating or ethylene treatment, whilst that from Merbein was artificially sweated for two or three days at a temperature up to 80° F., and was treated with ethylene during this time. In both cases the fruit was packed loosely into cases and transported by rail to the Government Cool Store in Melbourne. There the fruit was treated in the apparatus previously described,[2] graded, wrapped, and packed in Californian export orange cases.

The following treatments were tested:—

On fruit from Merbein and Curlwaa—

1. Washed in sodium bicarbonate 5 per cent. for eight minutes at a temperature of 110 to 115° F.; then sprayed with paraffin and wrapped in sulphite tissue wrapping paper.
2. As in 1, except that grease-proof paper was used.
3. Untreated, and wrapped in grease-proof paper.

On fruit from Merbein only—

4. Sprayed with paraffin wrapped in sulphite tissue.
5. As in 4, but wrapped in grease-proof paper.

Conditions During Transport.

The experimental fruit (284 cases) along with oranges from other parts, the whole consignment, amounting to 604 cases, was carried by the "Canadian Cruiser," leaving Melbourne on 24th June, by way of Panama, and it arrived in Montreal on 28th August, a period of nine weeks and two days.

The refrigerated space on the boat was designed for the carriage of frozen meat, and there was no system of ventilation, which is generally considered essential for the carriage of fruit. An attempt was made, however, to change the air in the hold by opening the door located at one end for fifteen minutes once every week. Although probably the only practical procedure under the circumstances, such ventilation was altogether inadequate, and the fruit must be considered as having been subjected to a very severe test.

The hold was kept throughout at from 38° to 40° F. which, from previous experiments, was considered the optimum temperature.

The oranges are tipped into the first tank of sodium bicarbonate and remain there for three minutes.

On arrival in Montreal, out of the 284 cases dispatched, 30 cases representative of the various treatments were examined in detail, and the condition of every orange recorded

Causes of Wastage.

Wastage was found to be due to the following causes:—

Moulds—

(*a*) Green mould, Penicillium digitatum.
(*b*) Blue mould, Penicillium italicum.
(*c*) Alternaria citri (Pierce), "core rot," "black central rot," &c.

The last-named infection commences as a small brown, depressed spot on the rind round the button, in which stage it has been termed "sore eye," and later it extends down the centre of the orange, where it produces masses of black spores. "Sore eye" is not invariably followed by definite alternaria infection, and it is possible that this condition is not an early manifestation of alternaria, but may be due to a physical injury, such as might be caused in the picking, and which predisposes to alternaria infection.

Skin browning, a condition which appears to be a physiological breakdown of the rind in cold storage, and variously attributed to injury and to low temperature. This occurs sometimes only in small spots, which do not seriously lower the value of the fruit, but sometimes has large confluent brown patches, which may involve a considerable portion of the skin.

Collapse, a condition of general physiological breakdown of the fruit, and which occurs at the end of its storage life. In the very early stages it is characterized by a loss of flavour, and sometimes by the development of a bitter taste. Later on, the skin becomes dull in appearance, and the white pulp yellowish in colour and sodden in texture, whilst still later the rind becomes soft and fawn-coloured, and infections of both green and blue moulds may appear, generally as numerous small colonies on the softened area.

Results of the Inspection.

The results of the examination are seen in the accompanying table, which shows the number of oranges in each treatment which were examined, and the incidence of the various defects expressed as percentages of this number. In cases where more than one defect was present on an orange, all are recorded.

The oranges emerging from the second washing tank, the paddle of which entirely submerges the fruit for five minutes.

The main conclusions to be drawn from the data secured are as follow:—

1. *Size of Fruit.*

No significant differences in keeping quality between oranges of the various sizes can be detected. This cannot be seen in the attached table because all sizes in each treatment have been grouped together.

2. *Washing and Spraying Treatments.*

Treatments prior to packing have definitely influenced the conditions of the fruit on arrival. Treatments 1 and 2 (see Table I.), wherein the fruit was washed in sodium bicarbonate, and, after drying, sprayed with paraffin, enabled the Curlwaa oranges to arrive 96 per cent. sound, as against 80 per cent. for the untreated fruit. In the case of the Merbein oranges the treated fruit was 72 to 81 per cent. sound compared with 48 per cent. in the untreated. The strict comparison in each case is between treatments 2 and 3, in which the same wrapping paper—grease-proof—is used.

On the other hand, treatments 4 and 5, carried out on Merbein fruit only, and consisting of paraffin spray alone are seen to have been deleterious; and 5, when grease-proof wrapping paper was used, has lowered the percentage of sound fruit to 22 per cent. This has been brought about by a great increase in the incidence of Blue Mould and to a somewhat smaller extent Green Mould. Previous experiments in Victoria on navel oranges have given similar results. It has usually been found that this treatment hastens the onset of physiological collapse, and renders the fruit at a late stage in its storage life more susceptible to Penicillium Mould attacks. It is suspected that this is the reason for the higher mould percentages in this case.

Conversely treatments 4 and 5 have greatly reduced the loss due to Sore Eye or Alternaria Rot. This, too, is in keeping with local trials, which have shown that the most effective treatment for controlling Sore Eye and Alternaria Rot in Valencia oranges in storage (navel oranges have seldom shown appreciable loss from this cause) is the paraffin spray.

3. *Wrapping Paper.*

The usual sulphite tissue wrapping paper has been compared with grease-proof paper similar to that in which butter is wrapped. For some time, a strong preference for the grease-proof paper has been held in certain sections of the trade. For the Curlwaa fruit the results are practically the same; compare treatments 1 and 2.

TABLE I.

Examination of navel oranges on arrival at Montreal, 28th August, 1931—left Melbourne 24th June:—

Treatment.	Number of Fruit Examined.	Bad Browning.	Sore Eye.	Blue Mould. *P. Italicum.*	Green Mould. *P. digitatum.*	Alternaria.	Total Fungus Infection.	Marketable Fruit.
		%	%	%	%	%	%	%
From Curlwaa.								
1. Washed Sod. Bicarb.; sprayed paraffin; wrapped Sulphite Tissue ..	739	0·3	4·7	0·8	0·7	0·5	2·8	96·2
2. Washed Sod. Bicarb.; sprayed paraffin; wrapped Grease-proof Paper	1,010	1·3	5·1	0·6	Nil	Nil	1·0	96·4
3. Untreated; wrapped in Grease-proof Paper	547	3·3	2·2	7·7	6·7	Nil	15·7	79·8
From Merbein.								
1. Washed Sod. Bicarb.; sprayed paraffin; wrapped Sulphite Tissue ..	704	2·7	32·4	3·0	3·4	1·0	10·8	81·0
2. Washed Sod. Bicarb.; sprayed paraffin; wrapped Grease-proof Paper	986	0·5	29·3	7·6	8·5	1·1	19·8	72·2
3. Untreated; wrapped in Grease-proof Paper	537	1·5	37·8	8·6	11·5	0·4	25·1	47·7
4. Sprayed with paraffin; wrapped in Sulphite Tissue	123	Nil	5·7	44·7	8·1	Nil	57·7	41·5
5. Sprayed with paraffin; wrapped in Grease-proof Paper	986	1·6	3·6	53·1	24·4	0·1	82·8	21·6

In the case of Merbein fruit, two comparisons are possible; 1 with 2, and 4 with 5. In both cases the grease-proof paper appears to have markedly lowered the percentage of sound fruit. The worst result was obtained when paraffin fruit was wrapped in grease-proof paper.

On this test the use of the grease-proof paper cannot be preferred to sulphite tissue. Not only has it failed to improve the keeping quality of the fruit; but, further, it is more costly and much more difficult and slow for the packers to handle.

4. *Comparison of the Two Districts.*

The fruit from Curlwaa carried much better than that from Merbein. It was much lower in moulds and very much lower in Sore Eye. In the standard treatment recommended the result was very satisfactory, more than 96 per cent. being landed sound approximately eleven weeks after picking. The comparable figure for Merbein is 81 per cent. Furthermore, the Canadian report says of the Curlwaa fruit that it was superior to the Merbein on arrival in both juiciness and flavour.

As previous local experiments have shown the Merbein fruit to have equally good flavour and keeping quality, a possible explanation of the difference on this occasion is that the Merbein consignment, prior to its delivery to the Committee for treatment and packing, was sweated at a temperaure of 70-80° F. in an atmosphere containing ethylene. It is possible that as a result of this treatment its rate of living was accelerated and its storage life consequently reduced. Possibly because of this, the Merbein oranges on arrival at Montreal had begun definitely to collapse. The Curlwaa fruit was not subjected to any such treatment, being treated and packed soon after picking. The effect of ethylene treatment is not merely to hasten the colouring of the rind, but it may also be expected to definitely accelerate the ripening processes of the fruit.

During the processing of the oranges the greener appearance of those from Curlwaa was very noticeable, and, indeed, a considerable amount of very green fruit was culled out.

This points to the necessity for a study of the effect of ethylene and sweating at high temperature on the storage life of oranges before such processes are used to colour oranges, for export or long local storage. There is room also for more work on the subject of maturity of fruit at picking time.

Further comment by the examiners states that "the type of pack left nothing to be desired, every case being in perfect condition from this aspect." The botanist noted, however, that the oranges "which were tasted with special and critical care were found to be more insipid when compared with Californian fruit." This statement applies to the Curlwaa fruit as well as to that from Merbein. The former, although superior on arrival, was itself definitely lacking in full orange flavour. He suggests that this might have been due to degree of maturity.

This suggestion is borne out by the fact that when these oranges left Australia, they were of excellent flavour, and quite comparable with the Californian oranges which have been imported into this country, and it must be concluded that the fruit had lost flavour during storage on the long voyage.

Experiments conducted by the Committee in Australia have shown that loss of flavour is the first indication that the fruit is approaching the limit of its storage life, and, thereafter, the onset of physiological collapse is very rapid and mould infection soon appears. This is supported, also, by the statement of the Dominion Botanist that samples of the oranges showed very considerable wastage due to moulds within a few days of removal to ordinary temperatures.

The condition of the fruit on arrival as regards actual mould infection was thus satisfactory, but the lack of flavour and ability to hold up when removed from the ship suggest that a voyage of nine weeks is too long, and that the fruit had deteriorated by natural processes, even though the incidence of moulds had been reduced to a minimum by the treatment.

This is in accordance with local experience over several seasons, which has shown that storge of navel oranges for longer than seven to eight weeks is rarely practicable, and if a successful export trade with Montreal is to be developed, faster and better equipped boats must be employed.

REFERENCES.

(1) Jour. C.S.I.R. 1931, Vol. 4, page 96.
(2) Jour. of C.S.I.R. 1930, Vol. 3, p. 69.

Cold Storage and Preservation of Eggs

By W. C. Rugg, Poultry Expert.

THE recognition by medical men and food specialists of the value of eggs has resulted in a steady demand at all seasons of the year for them. During the spring and early summer months eggs are plentiful, and prices fall considerably; on the other hand, in the autumn and winter new-laid eggs are scarce and bring high prices.

If it were not for the cold storage and preservation of the surplus eggs produced in the spring and early summer, prices during the winter would be so high that none but the wealthy could afford to buy them, and it would be almost impossible for managers of hospitals to obtain supplies.

Unfortunately, there are still a number of people who are of the opinion that an egg that has been in cool store is an inferior article of food. Nothing is farther from the truth, for in recent years methods of cold storage of foodstuffs have been brought up to a very high standard of efficiency. Provided that the eggs when stored are fresh and clean and the shells of good texture, and that the temperature of the cold chamber is maintained evenly throughout the period of storage (whether it be one month or six months), they will be in a perfectly satisfactory condition when taken out. Thousands of dozens of eggs are held at the Government Cool Stores for hospitals, hotels, producers, merchants, and others every year. The officers of some of the hospitals have told the writer that when removed after seven months' storage, they opened up in first-class condition. In most instances, it is impossible to tell cool stored eggs from new laid eggs.

"Candling" Eggs.

The most essential thing for success in the cold storage or preservation of eggs is to use only those of first quality. The method of ascertaining the internal quality is known as "candling." Candling means the examination of each egg before a strong light.

The egg must be turned quickly before the light and the attention of the candler should be concentrated on it during the movement. It should be so held that the short axis corresponds with the line of vision; it is not sufficient to place the end of the egg over the aperture of the candling lamp. The work requires a high degree of skill. The candler must be alert and intelligent, and a good colour sight is essential, because colour is the main guide to quality. Although a few weeks of training will secure reasonable proficiency, it takes time to acquire the experience necessary if a high standard of competence is to be maintained. The rate at which eggs can be candled depends not only on the experience of the candler, but on the quality of the consignments. It is stated that some skilled men can candle about 1,500 eggs an hour. The most widely used light is the 60 watt electric lamp of clear glass. A similar lamp of "Daylight Blue" glass is sometimes used, but brown-shelled eggs are more difficult to candle with this type of lamp. If electric light is not available, a petrol-gas lamp is the best substitute. The light must be shaded, leaving only a small aperture before which to hold the egg. Most operators prefer the light to be enclosed in a small box with an aperture slightly oval in shape and about an inch and a quarter in diameter. The box should be so placed that the rays of the light shining through the aperture do not strike the eyes of the candler when at work. Although the best results may be secured in a dark room where the full value of the light will be obtained, the work can be done satisfactorily during the day with a good lamp, provided it is placed in a subdued light and no daylight falls directly across the vision of the candler. This is less exacting for the candler than working for long periods in a dark room.

On candling the yolk should be just faintly visible, the white translucent and firm, and the air space about $\frac{1}{8}$ of an inch in depth. The yolk and albumen of an egg at the time it is

laid completely fill the shell, but subsequent cooling causes the contents to contract, leaving a small cavity at the larger end. This cavity increases with the normal evaporation of moisture through the pores of the shell. The white of a first quality egg should be firm; any movement of it should be slow, and no air bubbles should be apparent. The yolk should be central and regular in shape, and there should be no tendency for it to settle at either end or to one side. The colour of the yolk of eggs varies from very pale yellow to deep orange, and the candler should see that it is evenly distributed and not patchy. The yolk of a first quality egg, however deep in colour, has a bright appearance, and is readily distinguishable from a dense or "treacle" yolk. The shell may have a porous appearance, but eggs with weak shell patches should not be passed as first quality. Cracked eggs, no matter how slight the defect, are unfit for storage.

"Watery White" in Eggs.

One of the most common troubles in fresh eggs is the condition known as "watery whites." A large amount of research work has been and is being undertaken to ascertain its cause, but so far nothing definite has been ascertained. In some cases it may be due to malnutrition. Many eggs that have had rough handling either on the railway or in carriers' vehicles show a movement in the white. This movement is usually confined to one end, and does not always indicate that the white is watery.

Sometimes it is found that the shell membranes have parted, and thus fail to confine the contents of the egg to the normal position. When the inner shell membrane is broken, the white of the egg fills the air space and bubbles result. If the outer membrane be broken down, the white quickly becomes watery, so that an egg will rattle when shaken. It is well to remember, however, that an egg that rattles is not necessarily stale, and one which does not rattle is not necessarily fresh. The best way to judge whether the albumen is broken down is to note the movement of the whole shell contents when turning it before the light. If bubbles exist in the white it can be classed as second quality, and though quite good for immediate consumption, it is unfit for long storage. Eggs that have been washed in warm water, often show the albumen to have a clouded appearance, especially if they have been allowed to soak, even for a short time. The washing of eggs is fatal to their keeping qualities.

At the present time, I believe, the chief cause of the rejection of eggs intended for export is dirty shells. I have heard lately that it is proposed by a section of poultry men to launch an "Eat more eggs" campaign. I sincerely hope that, before doing so, they will hold a "Market your eggs clean" campaign. Egg producers should remember that a clean appearance adds to the value of eggs. Dirt and moisture injure the natural coating of the shell, thereby facilitating the entrance of bacteria; therefore, no effort should be spared to collect and market eggs in a spotlessly clean condition. Slightly soiled eggs can be cleansed with a damp cloth, but they should not be washed. In no circumstances whatever should badly soiled eggs be preserved or placed in cool store. Experience has proved that infertile eggs will keep in satisfactory condition for a longer period than will fertile eggs. To ensure that eggs intended for preservation will be infertile, remove all male birds from the pens two to three weeks before preserving begins.

Cold storage is easily the best method of holdings eggs for a long period.

Many producers and others are not aware that space is available at the Government Cool Stores for any person who will comply with the regulations, and is prepared to pay the low storage charges. A producer need not employ an agent unless he wishes. He can do his own business with the manager of the Government Cool Stores, Victoria Dock, who will supply full information on application. Eggs can be consigned direct to the Government Cool Stores, which is a railway goods siding.

Home Preserving.

Home preservation can be carried out quite satisfactorily, if the eggs are placed in preservative in a fresh condition—preferably not more than 24 to 36 hours after they are laid.

Probably the most satisfactory method of preservation is by waterglass, which is a solution of silicate of soda, and is now sold specially for the purpose in tins of 1 lb. and upwards. To prepare this preservative, 1 lb. (about ½ a pint) should be thoroughly stirred into 1½ gallons of boiling water. It is ready for use when quite cold. Some recommend a stronger solution, but there is less likelihood of eggs having a preserved flavour if the strength mentioned—1 lb. to 1½ gallons—is used. An earthenware crock or wooden tub is the best container, but some use galvanized iron vessels, and others kerosene tins.

Eggs can be placed in preservative from time to time, as they become available, but the top layer should be below the surface of the liquid. The receptacle should be kept in a cool place—in a cellar for preference.

Another method is the "Lime water" method. Lime water is made by mixing 2½ lbs. of freshly slaked lime in 5 gallons of clean cold water, and stirring thoroughly for three-quarters of an hour. The mixture should then be allowed to settle for about 12 hours, and the clear liquid poured off and used in the same way as set out for the water glass solution.

Another method is to cover each egg with a thin coating of lard, glycerine, or vaseline. Whatever method is adopted, the eggs must be kept in a cool place at a temperature of 40 to 45°. A high temperature will very quickly have a detrimental effect on all eggs, more particularly fertilized eggs.

An Export Orange

By J. M. Ward, Superintendent of Horticulture.

IN an Irymple orange grove, owned by Mrs. Miers, are several orange trees which have attracted much attention. The distinguishing feature of these particular trees is the high quality and the long-keeping character of the fruit they produce. Ripening in September, this fruit will remain on the tree without deteriorating or losing colour to any extent until March or April.

The former Citriculturist, the late Mr. S. A. Cock, was very much impressed with the possibilities this orange offered for the export trade, and he was instrumental in making a trial shipment of a case of the oranges to England. This trial case was shipped on the 24th March to Mr. F. White, Victorian Trade Commissioner in London. By arrangement with the P. and O. Company, the case was carried in the vegetable locker of the R.M.S. *Cathay*.

The oranges arrived in good condition, and Mr. White had samples distributed among the various large fruit-brokers and merchants, who were asked to express an opinion as to the general quality of the fruit and the most suitable time for its shipment to London.

Reporting on this trial case, Mr. White stated that the quality and appearance of the oranges were excellent, and he was sure there would be a ready sale on the English market. The oranges should be sent to arrive there early in October, and continue throughout November and December. During this period the supplies from other countries were not excessive, and therefore the Victorian oranges would meet with little competition.

The various recommendations contained in the reports of the fruit merchants on this trial case are summarized herewith. If success is to be achieved in orange export these requirements must be considered and adopted.

The vital question of quality is paramount. The cost of marketing 1st, 2nd, 3rd, and low-grade quality fruit is the same, and where such costs are relatively high, it would be distinctly unwise to jeopardize the prospects of success by exporting an inferior grade of fruit.

The agents estimated that fruit of similar quality to the samples received would bring 20s. per case, containing approximately 1½ bushels.

The English market desires a 3-inch orange packing 150's and 126's in the Californian export case. The case, which should be of softwood, has two cube-like spaces measuring internally 12 in. x 11½ in. x 11½ in., separated by a division, and contains approximately 1½ bushels.

In view of the very favorable impression created by this variety of orange, steps have been taken to bud-over several old trees in Mildura to this variety and, in the near future, it is hoped that young stocks will also be available for experimental and commercial purposes.

There has been considerable discussion as to the name of this particular variety of orange. Many prefer to call it a Valencia Late, but it has characteristics which possibly a Valencia Late does not possess. During this present season comparisons will be made, and it is hoped from these observations to establish definitely the identity of the variety.

Orchard and Garden Notes

By Edward E. Pescott, F.L.S.

The Flower Garden.

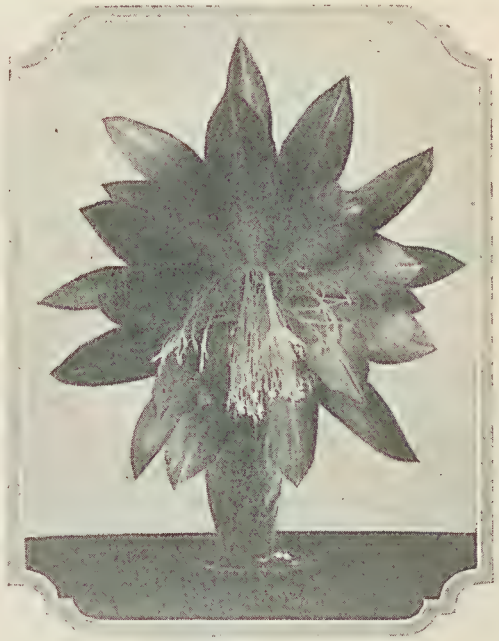
DAHLIAS should all have been planted by this time, and well staked. They require moderate watering for a month, and then ample supplies. Chrysanthemums should be well watered; and the plants must be watched for small caterpillars which destroy the growing centre buds. Arsenate of lead is the remedy. Gladioli corms may now be sown for the production of autumn blooms. The corms should be set about 3 inches deep in a good soil.

Flowering cactus plants have just finished, and are putting on their summer growths. There are two common beliefs about cactus: First, that they do not like manure; and, second, that they do not need water. Both of these suppositions are wrong. In summer cactus plants should be well watered; and a watering with weak liquid manure weekly will enhance their growth. But they must have no manure, and very little water in winter. The Phyllocactus, as illustrated, loves a sunny spot, where it grows and flowers well. Snails destroy these plants rapidly, so that the calcium arsenate mixture should be used in the snail season.

Sweet pea seed should be sown in January for winter flowers. The soil should be well manured and dug to at least 1 foot deep. Sow also seeds of Iceland poppy.

The Orchard.

Orchard work at the present time is mostly a matter of routine. Apple and pear trees should be sprayed with the white oil sprays following on arsenate of lead for Codling moth eradication. Regular cultivation should be continued after rain, or after any soil settling or compaction, especially after fruit picking and carting. Except for peaches and apricots, it is rather too early for summer thinning and tipping of laterals. This is an important work in January-February to assist in a better building up of the fruit buds.



A Phyllocactus Flower.

The Vegetable Garden.

Except for sowing seeds of lettuce, radish, mustard, and cress, and any other salad vegetable, very little seed sowing is done this month, except it be some French beans for a late crop.

Preparation should be made for sowing quite early in autumn, seeds of root crops and of the cabbage and cauliflower family. The soil should be very well dug over, and made light with very old sifted manure or leaf mould and sand. The seed-bed, after digging, should be made firm by trampling, loosening the surface again with a rake.

All vegetables growing and fruiting should be well watered in the summer. It is not enough to sprinkle the plants for a short time with a hose or a can; they must have abundant moisture. As soon as possible after watering, the soil surface should be cultivated into a loose tilth to prevent evaporation.

All lateral shoots of tomato plants should be thinned out, and long runners of melons, cucumbers, and similar plants pinched back to force more lateral growths.

Asparagus beds should be top-dressed with stable manure to feed up the crowns.

Professional Papers

[This section is devoted to professional papers and articles of a scientific character.]

Some Soil Types of Victorian Irrigation Areas.

W. R. Jewell, M.Sc., F.I.C., F.A.C.I., Agricultural Research Chemist.

During Sir John Russell's visit to Victoria in 1928, the author had the privilege of accompanying him on a comprehensive tour of the irrigation areas of Victoria when representative soil types were inspected, usually *in situ* by means of deep holes dug in the soil. These soil types were subsequently sampled and subjected to chemical and physical examination. The information thus obtained, supplemented by many further inspections and samples during subsequent months, makes it possible to describe in detail some of the main soil types encountered in these areas, and to indicate some of the problems involved in their successful cultivation. Although available data are not sufficient to locate the extent or boundaries of these types, it was considered desirable to put on record such information as is at present to hand.

THE SOIL PROFILE.

Before proceeding further it might be desirable to describe briefly and in general terms the basis of modern soil classification developed originally by the Russian school of soil scientists. Soil may result from the weathering, *in situ* of parent rock, or may be produced as sedimentary deposits laid down under water or by water action. Subsequent to its deposition or formation, it is acted on continuously by climatic factors, particularly rain, and it is the result of this action rather than the influence of the parent material that supplies the evidence which determines soil type and assists in soil classification.

In general, the effect of rain on soil is to leach out from the surface layers soluble constituents such as colloidal material, iron salts, &c., which are redeposited in lower layers. Eventually this action gives rise to a banded structure in the soil readily observed on the vertical sides of a hole. The bands, or horizons, run roughly parallel to the surface and usually bear no relation to the original stratification of the soil. A vertical section from the surface downwards through these horizons is known as the "soil profile," and the horizons are generally divided into three main divisions, A, B, and C.

The "A" horizon is the surface, leached layer from which soluble material has been removed. It is usually divisible into two subdivisions, A1, the top layer darkened by humus; and A2, the lower layer much lighter in colour due to leaching.

The "B" horizon is the band in which are deposited the accumulated leachings of clay, iron, humus, &c., from the "A" horizon. The "C" horizon is either the original parent rock or the original sedimentary deposit below the weathered horizons. It may include an intermediate or transitional stage between soil and parent material.

Although all three horizons are developed in moist temperate climates, it does not follow that all three will always be observed in any soil type. In fact, in certain climates no leaching may take place, and in arid climates soluble salts may be brought to the surface from lower layers. A fully leached soil is referred to as a "podsol," and as leaching becomes progressively less we pass from true podsols through "podyolic" and "feebly podyolic" soils to "brown earths" in which leaching is absent, and finally to the desert type where salts actually accumulate at the soil surface. It is not necessary here to go more fully into the general nomenclature given to different soil types by Russian scientists, but it may be pointed out that some Australian soils (e.g., Mallee) do not conform to any world standard types.

It will be apparent that as modern classification is based on soil profile and as profile is so profoundly influenced by climatic conditions, this method of soil classification has a climatic rather than a geological basis. Further, the profile is a fundamental characteristic of a soil, and a study of the profile as a whole and of its individual horizons gives a picture of the genesis and past history of the soil, and is an aid in studying its uses and limitations.

A comparison of different soils, based on profile study, may explain agricultural differences when surface appearances are similar, and may be of prime importance in applying to soils of one district available knowledge as to crops and treatment found suitable to soils in another district. The outstanding importance of profile studies in comparing different soils and in determining soil types and their boundaries will be obvious. In determining the suitability of soils for irrigation, where drainage is a major factor, surface conditions may be misleading, and it becomes imperative to base an opinion on an examination of the soil profile, particularly as to the physical condition of its lower horizons and the distribution and amount of soluble salts throughout the profile.

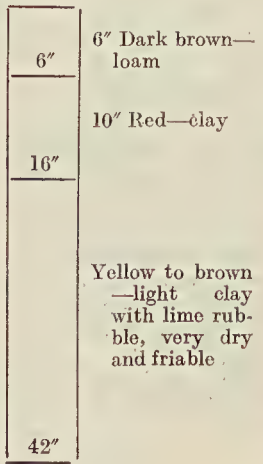
These brief remarks are sufficient to indicate that the modern study of soil types is not only of academic interest but also of prime practical importance. The extent to which soil surveys have developed in certain other parts of the world, particularly in America, is further evidence in this direction.

GOULBURN VALLEY DISTRICT.

In the Goulburn Valley district there is one predominating soil type, with local variations, which has been encountered at a number of places such as Tongala, Kyabram, Merrigum, Shepparton, &c., and which, apparently, is very general throughout the Valley. Its main feature is a heavy clay layer or clay pan close to the surface, the depth at which it appears varying from 6 to 15 inches. It is generally nearer the surface around Tongala, and at the greater depth towards Shepparton.

TONGALA.

A typical profile in the Tongala area (from allot. 107) is given herewith. It will be seen that a shallow depth of loam overlies a 10-in. band of red clay, under which the soil is of a much lighter and porous texture. Whether the clay layer is a true "B" horizon of accumulated leachings from above, or whether it bears no direct relation to the overlying layer, but is just one of a succession of deposits, is doubtful.



Mechanical Analysis, Reaction and Chlorine Content.

	0–6″.	6–16″.	16–42″,
	%	%	%
Coarse sand	4·4	10·3	0·7
Fine sand	13·9	26·3	5·6
Silt	20·9	14·3	21·7
Fine silt	16·8	17·2	36·9
Clay	16·5	38·7	25·9
Loss on acid treatment	2·0	2·7	1·1
Loss on ignition	6·3	7·1	4·7
Moisture	1·4	3·6	3·3
Reaction (pH Value)	8·3	8·6	9·0
Chlorine (%)	0·006	0·004	0·011

The high clay content of the second layer will be noted, while silts predominate in the third layer. The salt content, as indicated by chlorine, is quite normal.

This type of profile has been found in numerous instances around Tongala. The depth of surface loam rarely exceeds 8 inches. The percentage of clay in the clay band varies from 33 to 38 per cent., and the underlying layer is in some cases a silty light clay as in the profile given, and in other cases a more open sandy loam with a clay content of about 15 per cent. The ill-effects of this clay band are at times aggravated by the presence of a large proportion of replaceable magnesium and sodium in the clay complex. In these circumstances the clay band is less tractable than, and has inferior drainage properties to, a band of similar clay content in which the complex is of the normal calcium type. The reaction of the surface soil is usually slightly acid, although in some cases, as in the profile above, it is on the alkaline side.

Disadvantages of the Soil Type.

The presence of this clay pan, close to the surface, is the worst feature of this area and is the cause of a considerable amount of trouble in cultivation. It frequently has a detrimental effect on production, and in some cases has resulted in the failure of citrus and other trees.

It has two main disadvantages. In the first place, it is relatively impervious to moisture, and thus considerable difficulty is experienced in watering this area adequately, and the subsoil below the clay band is frequently not wetted at all. In addition, the clay pan holds up water after an irrigation, and roots may thus be waterlogged periodically. This has been shown to be

a contributory factor in the death of citrus in certain instances. Further, the surface soil is so shallow as to retain insufficient moisture for ordinary plant requirements.

In the second place, the roots of fruit trees or of lucerne experience great difficulty in penetrating the clay pan. Roots are often restricted to the surface layer alone, with consequent very limited supplies of plant foods and moisture. When roots do penetrate the clay band, the effort is frequently so great that they emerge stunted and ill-formed.

This clay pan, therefore, restricts watering and retards normal root development, thus limiting the zone available to the roots for moisture and food. Stone fruits, citrus and lucerne have all been observed suffering in growth because of this band.

Remedial Measures.

Obviously this type of soil cannot reach maximum productivity until by some means water and roots are enabled to pass freely through clay pan. In fact, such a procedure is often necessary if trees are to grow at all. Prior to planting stone fruits or citrus, it is highly advisable to dig out the clay pan in a hole 3 or 4 feet across and to fill in the hole with surface soil. The clay band is relatively thin and the underlying horizon is usually reasonably open, so that the roots of trees planted in this manner can readily get down into this satisfactory underlying strata. The hole thus made would also facilitate watering. In addition, subsoiling between the rows should be a beneficial aid to watering. That this method of planting is likely to be successful is shown by a case brought to the author's notice. On this particular block fifteen year-old citrus were planted in this manner on typical clay-pan soil, and are now said to be some of the best trees in the Tongala district.

With trees already planted the problem is more difficult; but subsoiling between the rows and heavy applications of gypsum, particularly around the trees, should in time make a decided improvement to trees that are not doing as well as might be. The application of gypsum should open up the clay pan and should, in addition, improve those pans which contain replaceable sodium in excessive amounts.

For lucerne, best results may be expected if deep subsoiling is possible prior to planting. On areas already planted an improvement should result from heavy applications of gypsum combined with judicious watering.

Chemical Composition.

CHEMICAL ANALYSIS—SURFACE 6 INCHES.

	Parts per 100,000.
Nitrogen	85
Phosphoric acid	67
Potash	355
Lime	224
Magnesia	202

The chemical composition given above is typcial not only of Tongala, but also of the Goulburn Valley area in general. From the low phosphoric acid content, it is obvious that lucerne and pastures require superphosphate for maximum growth, and the low nitrogen content and loss on ignition figure would indicate that sulphate of ammonia and cover crops ploughed in should be of distinct benefit to citrus. For stone fruits both nitrogenous and phosphatic fertilizers are probably necessary, while cover crops should improve the humus content.

KYABRAM AND MERRIGUM.

Profiles examined at Kyabram and Merrigum show the same clay band, sometimes 12 inches, and at other times only 6 inches below the surface. In this area the profiles examined were less satisfactory than at Tongala, in that the clay pan was higher and the underlying soil was of a less open texture. A typical profile (Allot. 106) is given herewith.

MECHANICAL ANALYSIS, REACTION AND CHLORINE CONTENT.

——	0–6″	6–21″	21–33″	33–72″
	%	%	%	%
Coarse sand ..	5·1	2·0	3·5	10·2
Fine sand	18·2	7·6	5·6	6·5
Silt	19·3	9·0	10·5	11·8
Fine silt	29·1	17·3	20·4	25·9
Clay	18·3	49·5	44·6	35·9
Loss on acid treatment	1·1	1·8	4·7	1·5
Loss on ignition ..	5·1	6·3	6·6	4·3
Moisture	2·0	5·3	4·9	3·8
Reaction (pH Value)	8·2	8·3	8·6	8·3
Chlorine (%) ..	0·005	0·007	0·007	0·046

The high clay content (nearly 50 per cent.) of the clay band and also of the horizons underlying the clay pan will be apparent. The salt content is normal, and the reaction, typical of this district as so far examined, is decidedly alkaline. In a few instances the surface layer contained a higher proportion of coarse sand and also cementing ingredients, which cause the layer to set rather hard on drying out. This feature has been thought to be the reason for the death of citrus on one block, but it seems more probable that the clay pan, 6 inches below the surface, should shoulder the blame.

Remedial Measures.

In soils of this type, marked benefit could not be expected from digging out the clay pan prior to planting because of the different nature of the underlying soil. Gypsum should, in time, exert an ameliorating influence, and judicious watering is obviously essential. That good results can be obtained on this soil if care and intelligence are exercised, is shown by the fact that on the block from which this profile was taken, stone fruits were doing particularly well.

The chemical composition given under the Tongala type is, as stated, typical of the Goulburn Valley in general, so that the remarks made earlier on fertilizers are applicable here also.

SHEPPARTON.

As far as can be ascertained from a preliminary examination, it would appear that in general the soil type around Shepparton shows a considerable improvement on those already described in that the clay band is more deeply seated, and it is frequently less dense. A profile encountered on allot. 32, and somewhat typical, is shown in the accompanying diagram.

MECHANICAL ANALYSIS, REACTION AND CHLORINE.

——	0–8″	8–14″	14–28″	28–36″	36–46″	46–60″
	%	%	%	%	%	%
Coarse sand	16·9	17·4	3·7	12·4	58·0	2·3
Fine sand ..	41·8	39·0	18·3	47·4	19·8	40·6
Silt ..	20·0	23·1	22·1	15·4	7·4	24·8
Fine silt ..	7·7	8·6	6·4	4·0	3·6	10·6
Clay ..	7·2	7·4	37·3	14·3	7·2	11·5
Loss on acid treatment	0·8	0·5	1·2	1·1	0·6	3·2
Loss on ignition ..	2·9	1·8	4·8	2·4	1·4	3·6
Moisture ..	1·0	0·8	5·5	1·9	1·0	2·5
Reaction(pH)	8·2	7·9	7·2	8·5	8·7	8·5
Chlorine (%)	0·014	0·009	0·013	0·010	0·008	0·007

In this profile the heavy red clay band is 14 inches below the surface, and the soil underlying the clay is sandy and open. The remarks already made on cultural methods apply also in this instance, but to a somewhat lessened degree because of the slight improvement in soil type. A chemical analysis of the surface soil was similar to that already recorded.

In many of the recent, and therefore immature, soils of these irrigation districts the profile is based on a succession of deposits rather than on horizons developed by weathering. This particular profile is a marvel of variability in that there is little relationship between the various layers.

The profiles given from comparatively widely-separated areas in the Goulburn Valley show a really remarkable similarity in general type, the main feature of which is the difficult red clay close to the surface. The extent of the area in which this type predominates is emphasized by other bores put down in the Goulburn Valley, and a study of the profile explains why these soils have always been considered as "tight" and difficult to manage under irrigation.

The genesis of the various horizons in this profile is not altogether clear. Although it seems probable that the red clay band is a "B" horizon of deposition of leached material, it is possible that the various layers have little to do with one another and that they represent a succession of deposits laid down under different conditions, peaceful water depositing clay and sandy material being deposited from water in motion. Again, the surface and sandier layers may have been wind borne.

COHUNA DISTRICT.

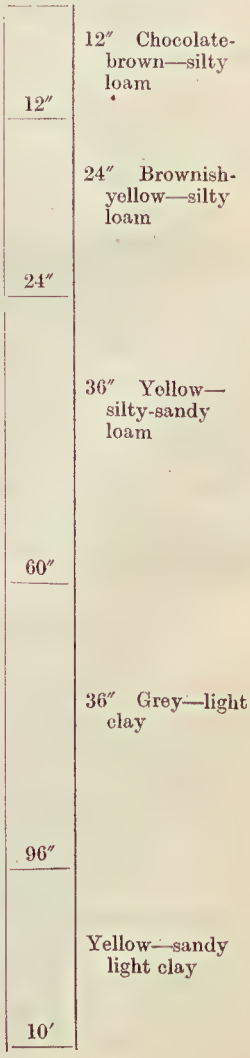
In the Cohuna district one encounters an entirely different predominating soil type in which the high clay content of each horizon, including the surface soil, is the outstanding characteristic. The soils are heavy and, when irrigated, are devoted largely to the production of fodder crops, mainly lucerne. Unfortunately, parts of this area are badly salted, and instances where salt is present in the abnormally high concentration of about 1 per cent. from the surface down to 10 feet are not rare. Nothing can be done with such badly-salted blocks, as the salt concentration is sufficiently high to preclude the successful growth of any crops, and the heavy nature of the soil renders impossible any washing out of the salt.

An extreme example of the heavy soils that occur in this district is given in the accompanying profile, taken adjacent to Allotment 11A, Gunbower West.

Mechanical Analyses and Reactions (pH Values).

	0–12″	12–48″	48–65″	65″–10′
	%	%	%	%
Coarse sand ..	0·6	0·4	0·4	0·2
Fine sand	13·1	11·7	11·2	13·2
Silt	15·0	15·6	14·6	18·4
Fine silt	21·2	23·1	17·1	20·7
Clay	37·0	39·0	45·1	37·1
Loss on acid treatment	2·4	3·0	2·2	1·5
Loss on ignition ..	5·6	4·9	5·6	5·2
Moisture	4·4	4·2	5·6	5·0
Reaction (pH value)..	7·4	7·8	7·8	4·8

The high clay content in each layer from the surface down to 10 feet is the most striking feature of this profile, together with the comparatively high silt contents. Soils of this type must present difficulties in watering, and they are best suited for the production of such crops as lucerne. It will be noted that this profile is uniformly alkaline in reaction until the lowest horizon is reached, when there is a sudden change to a markedly acid reaction, due possibly to water-logged, anaerobic conditions existing at this depth.



Soils similar to this profile, in which the lower horizons have about 44 per cent. clay and 20 per cent. silt, are common in the Cohuna district, although in some cases the higher horizons, while still heavy, are somewhat lower in clay content. The almost complete absence of coarse sand is general in all soils examined in this district, except, of course, in the case of isolated sand ridges.

One of the few lighter soils encountered is shown in the accompanying profile, taken from between Allotments 3 and 4, Gunbower West.

MECHANICAL ANALYSES AND REACTIONS (pH VALUES).

—	0–12″	12–24″	24–60″	60–96″	96″–10′
	%	%	%	%	%
Coarse sand ..	0·5	0·2	0·8	2·2	9·2
Fine sand ..	19·8	14·4	41·6	16·9	39·5
Silt	31·0	29·8	28·3	13·5	9·0
Fine silt ..	18·8	22·9	12·0	29·4	9·9
Clay	21·0	23·7	11·5	27·9	24·4
Loss on acid treatment ..	1·8	2·5	0·6	1·0	0·7
Loss on ignition..	4·6	4·1	2·7	3·8	3·6
Moisture ..	2·3	2·5	1·4	3·4	2·9
Reaction (pH value) ..	8·3	8·6	7·2	7·4	7·8

In this case silt is the predominating ingredient in all but the deepest horizon and there is a departure from the more usual grey colour. The profile is alkaline throughout, being most alkaline at the surface.

Methods of improving the soils in this district are not very obvious, and where they are badly salted little can be done. As elsewhere, there is a deficiency of phosphoric acid, and superphosphate obviously is required for lucerne and other crops. In many cases it is probable that applications of gypsum would, in time, have an ameliorating action in opening up the texture and in reducing the sometimes excessive alkalinity.

MILDURA DISTRICT.

Travelling down the Murray, no mention will be made of the soils of such settlements as Woorinen, Nyah, Tresco, &c., as these soils either have been, or shortly will be, described and surveyed in detail. Passing to the Mildura district the soils encountered naturally differ in practically every detail from those already mentioned, as Mallee soils are now encountered. The accompanying profile shows typical sand ridge soil.

MECHANICAL ANALYSES AND REACTIONS.

—	0–30″	30″–7′
	%	%
Coarse sand	56·8	41·6
Fine sand	28·4	31·8
Silt	0·8	0·5
Fine silt	2·1	1·9
Clay	5·7	9·8
Loss on acid treatment ..	1·1	9·4
Loss on ignition	2·4	5·8
Moisture	1·3	1·7
CO_2	..	3·9
Reaction (pH value)	8·5	9·0
Chlorine (%)	·004	·006

This is typically a wind-blown soil, and naturally sand predominates over all other constituents. The somewhat higher clay content below 30 inches and the presence of lime in the lower horizon are indicative of considerable weathering since the formation of the ridge. The soil is open and free—draining down to at least 7 feet, with an absence of free lime to 30 inches and of any appreciable amount of rubble throughout. As far as texture is concerned it can be considered an ideal citrus soil. The salt content is normal while the reaction is highly alkaline—somewhat more so than is desirable for citrus.

The chemical composition of the surface 30 inches is as follows, in parts per 100,000 :—

Nitrogen	40
Phosphoric acid ..	26
Potash	256
Lime	590
Magnesia	160

and shows a decided deficiency in nitrogen and phosphoric acid with normal contents of other plant food ingredients.

At Curlwaa, on the other side of the Murray, excellent orange groves are established on soil of equal sandiness, although here the area is not a sand ridge but originally box country and the soil is grey in colour.

Of course, the most common soil type in the Mildura district consists of a sandy loam surface soil, generally red in colour, underlain by rubbly lime, under which is a red light clay containing much soft lime. The lime gradually diminishes, gypsum bands frequently appear, and eventually at about 10 feet blue clay is encountered. Numerous variations of this major type are encountered, and it is well known that in the

Mallee generally native vegetation is a reliable indication of the soil type on which it is growing. Two instances of correlation of soil type with vegetation are given below, taken on virgin country at Merbein South. The two profiles were quite close together, but slight variations in level (and, therefore, in past flooding) are sufficient to cause pronounced modifications in soil type—a fact that impresses one throughout all the irrigation areas.

The profile below is from virgin Mallee country (*E. oleosa*).

9″	9″ Grey—sandy loam, with lime
21″	12″ Pale red—sandy loam with rubbly lime
41″	30″ Red-brown—loam with much soft lime
71″	30″ Red-brown—loam, with lime mainly as soft streaks. Less lime and heavier than above

Mechanical Analyses and Reactions.

——	0–9″	9–21″	21–41″	41–71″
	%	%	%	%
Coarse sand ..	36·6	29·4	24·4	27·9
Fine sand	24·7	22·4	18·2	20·4
Silt	1·5	2·1	3·0	4·2
Fine silt	6·4	5·2	7·8	8·3
Clay	6·5	9·4	11·4	18·7
Loss on acid treatment	17·0	26·8	29·7	11·4
Loss on ignition ..	10·3	13·5	15·3	7·6
Moisture	1·9	2·2	2·9	4·7
CO_2	6·5	12·2	13·3	4·2
Reaction (pH value)	8·9	9·1	8·8	8·7
Chlorine % ..	·022	·110	·142	·178

The next profile is from neighbouring virgin Blue Bush country (*Kochia scdifola* and *K. pyrimadata*).

12″	12″ Grey-pale red—sandy loam with lime
33″	21″ Pale red—sandy loam with much soft lime
60″	27″ Green—clay with red coating, some lime
78″	18″ Green—clay with much gypsum (gypsum band)
	Grey and brown—clay, no lime

Gypsum pockets first appear at 3′ 6″.

Mechanical Analyses and Reactions.

——	0–12″	12–33″	33–60″	60–78″	78″
	%	%	%	%	%
Coarse sand ..	25·3	18·7	13·5		22.6
Fine sand ..	22·9	21·2	21·7		23·2
Silt	2·8	4·1	4·5		3·4
Fine silt	5·6	8·7	10·2	Too	6·5
Clay	11·9	11·5	26·8	much	32·3
Loss on acid treatment	24·7	27·9	12·4	gypsum	1·7
Loss on ignition ..	13·5	15·4	8·7		4·7
Moisture	2·2	3·0	5·2		5·2
CO_2	11·0	12·8	4·5		..
Reaction (pH) ..	9·1	9·2	8·9		7·3
Chlorine (%) ..	·003	·058	·205		·213

The general differences between the two profiles are obvious and need not be unduly stressed. The Blue Bush profile is considerably heavier throughout than the Mallee, and the occurrence of gypsum in the former is an interesting difference. Blue Bush country is generally higher in soluble salts, as indicated by this occurrence of gypsum and by the higher salt (chlorine) content. In both cases there is an increase of salt with depth, a factor which frequently causes subsequent trouble, the salt rising to the surface and reaching toxic proportions after irrigation has been in progress for some time.

The chemical analyses of the surface soils from both profiles are given below in parts per 100,000 of air-dry samples :—

	Mallee.	Blue Bush.
Nitrogen	56 ..	39
Phosphoric acid ..	54 ..	35
Potash	536 ..	920
Lime	8,380 ..	12,140
Magnesia	712 ..	813

These are similar and are typical of many Mallee soils, being low in nitrogen and phosphoric acid, with high contents of potash, lime and magnesia.

On the whole, a high sand (50 to 60 per cent.) and a low silt content are common to soils of this district. Clay in general is not high, and even when it does reach somewhat high proportions in the lower horizons its characteristics are modified by large proportions of lime. Rubbly lime is often an objectional feature, and highly alkaline reactions are common. Gypsum or sulphur may be used to reduce this alkalinity, but lime should not be used on these soils.

In some cases a low silt figure is associated with a high clay content (as in the lowest horizon of the Blue Bush profile). While this is not uncommon in northern Victoria it is not generally the case, as usually silt increases with increase in clay content, and the anomaly presents an interesting problem. The origin of the enormous quantities of lime in many of these soils and the mode of formation of limestone rubble bands are two further proolems on which at present little information is available.

MAFFRA DISTRICT.

In conclusion, a few types of an entirely different series of soils will be discussed. These are the Tertiary soils occurring in the Maffra–Sale district in eastern Gippsland. They were mostly river flats originally, and those described are devoted mainly to sugar beet growing and to dairying, and are either irrigated or commanded by irrigation channels from Glenmaggie Weir. Compared with northern irrigated soils they are very rich and productive; in fact, they compare favorably in this respect with all but a few soils in Victoria. They are generally fairly heavy in clay, although they behave rather as loams or clay loams and are characterized by high silt contents, very little change with depth and, in all but second class land, high contents of the usual plant food constituents. It should be noted that whereas all the foregoing mechanical analyses were determined by the Robinson Method, the later International Method was employed in all cases that follow.

NEWRY.

Probably some of the highest class land occurs in the Newry district, and the following is a typical profile :—

12″	12″ Dark grey-black—loam.
	21″ Light brown—silty loam.
33″	
	Lighter brown—fine sandy silt.
42″	

Mechanical Analyses and Reactions.

——	0–12″	12–21″	21–42″
	%	%	%
Coarse sand	0·4	0·6	0·6
Fine sand	14·3	37·6	65·8
Silt	42·2	33·2	19·0
Clay	33·3	24·7	12·6
Loss on acid treatment ..	2·1	1·0	0·7
Loss on ignition	10·9	4·7	2·5
Moisture	1·5	0·8	0·4
Reaction (pH value)	5·8	5·8	7·2
Chlorine (%)	·020	·020	·016

The marked difference in this profile from any already described will be noted. There is an almost entire absence of coarse sand, fine sand increases with depth, while clay and silt decreases—an indication that the soil is of comparatively recent origin. The reaction in the two upper horizons is acid, while the lowest is practically neutral. The high loss on ignition figure in the surface layer, common to the better soils of this district, shows a high content of organic matter.

The chemical composition of the surface soil, given below in parts per 100,000, shows this soil to be exceptionally rich, based on Victorian standards. There is a high content of all the plant food constituents, including phosphoric acid.

Nitrogen	266
Phosphoric acid ..	135
Potash	475
Lime	459
Magnesia	504

The contents of replaceable bases, given below in Mg. Eqvts. per 100 grms. of soil, are interesting. The clay complex is essentially a lime one, with a high proportion of the total lime present in replaceable form.

Calcium (Ca)	16·23
Magnesium (Mg) ..	5·65
Sodium (Na)	0·10
Potassium (K) ..	0·26

BOISDALE AND POWERSCOURT.

The few soils examined at Boisdale and Powerscourt were very similar in type, and, like that of Newry, showed a great depth of soil. A profile taken at Powerscourt is as follows :—

12″ Dark grey—loam.

12″

8″ Grey—medium clay, brown mottled.

20″

12″ Grey and brown—medium clay.

32″

Grey brown—silty light clay.

42″

Mechanical Analyses and Reactions.

——	0–12″	12–20″	20–32″	32–42″
	%	%	%	%
Coarse sand ..	6·3	10·4	6·1	6·0
Fine sand	18·9	21·9	23·9	34·4
Silt	30·9	26·7	31·3	31·3
Clay	33·1	37·0	35·2	26·4
Loss on acid treatment	1·9	1·3	1·1	0·6
Loss on ignition ..	11·0	6·1	5·3	3·6
Moisture	1·6	1·2	1·2	0·9
Reaction (pH value)	5·6	6·3	7·9	8·9
Chlorine (%) ..	·008	·020	·024	·040

The clay content below the surface horizon is greater than at Newry—in fact the soil shows a great uniformity in mechanical composition from the surface down to the depth sampled. Although the surface contains 33 per cent. clay it behaves in the field rather as a loam. In this profile the reaction is acid at the surface and becomes alkaline at depth.

The chemical analysis and replaceable bases of the surface horizon, given below, are somewhat similar to those of the Newry soil and reveal great fertility.

Chemical analysis—parts per 100,000 :—

Nitrogen	311
Phosphoric acid ..	165
Potash	201
Lime	374
Magnesia	294

Replaceable bases—M.E's per 100 grms. of soil.

Calcium (Ca) ..	11·10
Magnesium (Mg) ..	5·06
Sodium (Na)	1·40
Potassium (K) ..	0·62

BUNDALAGUAH.

This centre is not on recent river flats and the soil is graded as rather poor second class, although it responds well to beet production under irrigation. The profile shows it to be much lighter than the soils already described from this district. Fine sand and silt predominate. The higher clay content of the subsoil may be due to washing down from the surface layer—an indication of a more mature profile than those already inscribed.

Mechanical Analyses and Reactions.

——	0–12″	12‡–42″
	%	%
Coarse sand	8·7	1·7
Fine sand	47·8	36·5
Silt	23·2	29·2
Clay	15·7	28·7
Loss on acid treatment	0·7	0·8
Loss on ignition	4·3	4·6
Moisture	0·6	1·3
Reaction (pH)	6·1	6·3
Chlorine (%)	·006	·006

The inferiority of this soil as compared with the foregoing is reflected in its chemical analysis and content of replaceable bases, given below. A comparison of these figures with those already given shows that this soil contains much less of the usual plant food constituents and is deficient in phosphoric acid.

Chemical analysis—surface soil—parts per 100,000 :—

Nitrogen	170
Phosphoric acid ..	54
Potash	264
Lime	157
Magnesia	242

Replaceable bases—M.E's per 100 grms. of soil.

Calcium (Ca)	4.57
Magnesium (Mg) ..	2.18
Sodium (Na)	Trace
Potassium (K) ..	0.26

OTHER CENTRES.

Profiles from other centres bear a close resemblance to one or other of those already described, and to give them here would be needless repetition. At Stratford the profile examined was almost identical with that at Boisdale, but the chemical composition was inferior and resembled that of Bundalaguah. Profiles examined at Lindenow and Hillside were similar to those at Bundalaguah and Newry respectively, and the chemical analyses of their surface soil in both cases indicated high fertility.

All river-flat soils examined in the Maffra district could be described as immature, and the many characteristics they have in common have already been noted. From the point of view of beet-growing the acid reaction in the surface horizon is of particular interest. It is claimed that beet does not reach maximum production if the soil reaction is below 7 (i.e., in acid soils). This would suggest that lime could be beneficially applied to these beet lands, and there is evidence to suggest that liming does improve beet yield in this district.

Standard Herd Records

For Quarter ended 30th September, 1931

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 644, of which 402 qualify for the certificate.

The amount of butter fat required for qualification varies according to the age of the animal (up to 5 years at time of calving), the standards being as follow :—

Junior 2 year old (under 2½ years at time of calving) .. .. .. 230 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving) .. .. 250 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving) .. .. 270 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving) .. .. 290 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving) .. .. 310 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving) .. .. 330 lb. butter fat.
Mature cow 5 years and over .. .. 350 lb. butter fat.

(Except where otherwise stated, the period of Test was 273 days.)

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Allwood, A., Stanhope (Friesian)	3	3	Greenwood Oakwood Empress 2nd	Vol. 2	1.11.30	25½	8,481	3·56	301·74	230	Jr. 2	
			Tarrangower Countess Helen	Vol. 2	5.12.30	27½	13,661	3·30	451·48	310	Jr. 4	
			Tarrangower Countess Jessica	Vol. 2	8.12.30	35½	14,705	3·57	525·28	290	Sr. 3	
Alston, N. B., Romsey (Jersey)	5	5	Rosyth Lady Rose ..	26378	4.10.30	7	6,506	5·81	378·16	310	Jr. 4	305, 375
			Rosyth Princess Rose..	28372	6.10.30	18	8,489	4·80	407·82	250	Sr. 2	363
			Rosyth Meadow Sweet 2nd	Vol. 18	31.10.30	7	5,259	4·46	234·33	230	Jr. 2	
			Aberdour Romany Rose	26376	1.11.30	12	7,403	5·86	434·07	350	Mature	391, 412
			Rosyth Lady Roseleaf	Vol. 18	21.11.30	10½	4,863	5·24	254·58	230	Jr. 2	
Anderson, J., Lyndhurst (Jersey)	8	4	Canary 19th of Kingsvale	18598	28.9.30	9	6,414	4·69	301·10	350	Mature	291, 321, 260,
			Kingsvale Viola 8th ..	28379	28.9.30	12	4,539	5·13	232·86	230	Jr. 2	
			Linda 57th of Kingsvale	12856	15.10.30	8	5,453	4·84	263·74	350	Mature	288, 424, 341, 349, 293
			Canary 16th of Kingsvale	14115	5.11.30	8½	5,617	5·01	281·27	350	Mature	290, 292, 292
			Kingsvale Brunette 25th	28373	11.11.30	10	4,307	4·51	195·47	230	Jr. 2	
			Kingsvale Brunette 23rd	24205	17.11.30	12	5,768	5·39	311·18	310	Jr. 4	262, 267
			Rosella 11th of Kingsvale	16591	2.12.30	13½	6,408	5·80	371·62	350	Mature	336, 318, 455, 332
			Kingsvale Canary 26th	28375	10.12.30	12	4,547	5·21	237·06	230	Jr. 2	
Archibald and Sons, Sale (Jersey)	5	2	Glenallan Gaiety's Countess	25722	10.10.30	9½	4,532	6·17	279·82	250	Sr. 2	267
			Glenallan Blue Bell ..	25226	15.11.30	17½	6,755	4·13	279·16	250	Sr. 2	309
			Glenallan Royal Primrose	25227	26.11.30	10	4,559	5·11	232·86	250	Sr. 2	250
			Studleigh Empire ..	19878	26.11.30	10½	4,085	5·90	241·19	350	Mature	209, 253, 288, 276
			Gnarbrook Myra ..	24420	6.12.30	14	5,307	5·67	301·06	330	Sr. 4	378
Archibald, L. R., Tongala (Jersey)	1	1	Maiwand Rose ..	25881	27.9.30	7½	5,751	4·78	275·07	270	Jr. 3	314

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Armstrong, W. J., Somerville (Jersey)	1	1	Wompini Margaret ..	24602	7.11.30	13	6,099	6·22	379·64	330	Sr. 4	
Atherton, W. H., Murraydale (Jersey)	5	4	Beverley Empress 2nd	25731	11.10.30	19½	6,211	5·64	350·09	250	Sr. 2	256
			Wattle Bloom of Beverley	18611	21.10.30	20½	8,862	4·41	390·45	350	Mature	329, 343, 350, 329
			Beverley Rarity 4th ..	28393	31.10.30	14½	5,302	4·70	249·36	230	Jr. 2	
			Beverley Tit Willow ..	25735	2.12.30	20½	6,151	5·46	335·77	250	Sr. 2	262
			Beverley Cream Lassie	25730	6.12.30	15	5,233	5·05	264·43	270	Jr. 3	219
Atkinson, W. K., Swan Hill (Dairy Shorthorn)	3	2	Willow Park Queenie 15th	Vol. 1	7.10.30	15½	9,680	4·00	387·31	290	Sr. 3	362
			Willow Park Princess 5th	Vol. 1	28.10.30	19½	12,342	4·13	510·24	350	Mature	293, 338, 424, 476
			Willow Park Comet 2nd	Vol. 1	3.12.30	20½	9,569	3·64	347·94	350	Mature	239, 311, 363
Ballarat Orphanage, Ballarat (Jersey)	7	3	Dunalister Perree's Quick Sand	9633	28.9.30	14	5,659	5·27	298·26	350	Mature	304, 331, 311
			Dunalister Perree's Mannakins Attraction	23359	8.10.30	12	5,564	5·71	317·67	350	Mature	267, 318
			Dunalister Starbright's Duke's Mirthmaker 2nd	24248	1.11.30	9	4,621	6·44	297·61	290	Sr. 3	242, 193
			Tavistock Lady 3rd ..	22967	9.11.30	10½	5,493	5·47	300·44	350	Mature	244
			Orphanage Doris ..	25255	14.11.30	10½	6,890	5·17	356·29	270	Jr. 3	285
			Tavistock Audrey Molly 2nd	22966	2.12.30	7	5,091	5·80	295·04	350	Mature	237, 344
			Tavistock Mystery ..	23052	8.12.30	17	6,301	5·70	359·17	350	Mature	361, 416
Barber Bros., Somerville (Jersey)	1	1	Somerville Valdere ..	Vol. 18	25.12.30	21	7,126	5·13	365·23	270	Jr. 3	
Barrett, J. W., Trafalgar (Ayrshire)	2	..	Fairlawn Pride ..	14323	29.11.30	7½	7,055	4·04	285·06	350	Mature	
			*Fairlawn Veronica ..	14325	12.12.30	4	6,060	3·86	233·98	350	Mature	
Bassett-Smith, C., Kyabram (Red Poll)	5	2	Bahama	238A	16.10.30	..	6,906	4·08	281·79	350	Mature	294, 245, 297
			Victoria Warplane ..	1759B	18.10.30	13	8,588	4·18	358·78	350	Mature	288, 274
			Victoria Stripe ..	723A	30.10.30	5½	6,903	3·30	227·48	350	Mature	295, 223, 296, 350, 361
			Flowing Vale Astroletta	..	14.11.30	13	8,321	3·79	315·61	310	Jr. 4	271
			Victoria Cutty Spark ..	1756B	19.11.30	12	8,331	4·00	332·98	350	Mature	401, 393
Belfield, G. H., Coleraine (Jersey)	1	1	Wootong Vale Sovereign Queen	21117	4.10.30	9	7,860	5·42	425·92	350	Mature	345, 434
Bidgood, F., Staghorn Flats (Jersey)	2	2	Sir Fancy's Larkspur of Staghorn	10156	22.10.30	21½	9,651	4·87	469·61	350	Mature	277, 309, 421, 456, 405, 450, 459
			Staghorn Master's Madeira 2nd	28456	23.10.30	17½	5,618	6·47	363·53	230	Jr. 2	
Black, Mrs. A. J., Noorat (Jersey)	2	2	Noorat Gazelle ..	25268	13.10.30	13	5,793	4·73	274·07	270	Jr. 3	262
			Noorat Belle ..	Vol. 18	23.10.30	23½	6,856	4·80	329·24	230	Jr. 2	
Black, I. S., Noorat (Ayrshire)	1	1	Mount Noorat Boronia	Vol. 23	7.10.30	15½	7,366	3·74	275·43	230	Jr. 2	
Bolton, S., Mannerin (Jersey)	1	1	Glenmavis Grey Lady	25283	30.10.30	18½	7,967	5·11	407·46	250	Sr. 2	

* 210 days in test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Box, Dr. J., Noojee Farm (Jersey)	1	..	Tooronga Muriel ..	28480	31.10.30	4½	3,582	5·00	179·17	230	Jr. 2	
Box, Dr. J., Surrey Hills (Jersey)	1	..	Jessie 44th of Melrose..	19977	5.10.30	15½	6,699	5·03	336·87	350	Mature	262, 301
Box, Dr. J., Whittlesea Farm (Jersey)	2	2	Aveley Starbright 5th	28478	11.10.30	10½	5,346	5·18	277·01	270	Jr. 3	
			Tooronga Princess Jessie	28481	15.10.30	11½	4,655	6·52	303·63	250	Sr. 2	
Broad, A. A., Sutton Grange (Jersey)	4	4	Daffodil of Grangelea	18648	29 9.30	25½	9,692	5·17	500·70	350	Mature	433, 500, 500
			Grangelea Primrose 2nd	26392	8.10.30	21	7,545	5·31	400·75	250	Sr. 2	318
			Grangelea Roseleaf 2nd	26394	11.10.30	20½	8,023	4·79	384·23	250	Sr. 2	305
			Grangelea Primrose ..	23007	14.12.30	27	8,898	5·32	473·19	350	Mature	370, 462, 459
Buchanan, J. M., Flinders (Ayrshire)	11	7	Gleneira Decoy ..	20126	30.9.30	18	7,526	4·04	304·40	270	Jr. 3	
			*Gleneira Fritter ..	21519	6.10.30	4	5,235	3·87	202·57	230	Jr. 2	
			Gleneira Nessie Algie ..	20147	7.10.30	4½	5,517	3·91	215·61	250	Sr. 2	
			*Gleneira Igloo ..	18057	8.10.30	4	6,765	3·63	245·73	310	Jr. 4	
			*Gleneira Lapwing ..	20136	9.10.30	4	7,335	3·92	287·47	270	Jr. 3	
			Gleneira Nymph ..	21536	10.10.30	5	4,255	4·15	176·50	230	Jr. 2	
			Gleneira Frown ..	21520	11.10.30	12½	7,050	4·46	314·32	230	Jr. 2	
			Gleneira Hawthorn ..	20131	11.10.30	12	6,131	4·43	271·45	270	Jr. 3	
			Gleneira Legacy ..	21529	12.10.30	13½	5,714	4·13	235·98	230	Jr. 2	
			Choice of Gleneira ..	10818	15.10.30	16½	10,118	4·29	434·09	350	Mature	
			Gleneira Dangle ..	21516	17.10.30	16½	6,341	4·33	274·55	230	Jr. 2	
Burley and Sons, Narre Warren North (Jersey)	1	..	†Lucinda Vale Canella..	Vol. 18	2.11.30	4	2,450	6·11	149·74	230	Jr. 2	
Cameron, D., and Sons, Valencia Creek (Jersey)	2	2	Studleigh Harebell ..	25293	9.10.30	17	7,850	6·20	486·52	310	Jr. 4	428
			Studleigh Dianthus 3rd	25287	10.12.30	17	6,888	5·64	388·65	290	Sr. 3	315, 380
Canobio, J., Bena (Ayrshire)	2	1	†Glen Erin Welcome ..	14595	4.10.30	4	5,820	3·72	216·41	350	Mature	181
			Glen Erin Wakeful ..	20160	5.10.30	15	7,818	3·72	291·12	230	Jr. 2	
Cayley, W. C., Werribee (Ayrshire)	2	..	*Joy Queen of Riversdale	13304	6.12.30	4	7,965	3·89	310·05	350	Mature	414, 514, 603
			Majesty of Riversdale..	13305	16.12.30	7	6,923	3·96	273·90	350	Mature	265, 323
Chadderton, J. E., Hamilton (Jersey)	1	1	Glen Leigh Thora ..	28534	16.11.30	14	5,575	4·81	268·31	230	Jr. 2	
Charlton, J., Stoney Creek (Jersey)	2	2	Lumeah Clarabelle ..	28539	30.9.30	9½	4,695	5·64	264·91	230	Jr. 2	
			Lumeah Bluebelle ..	28538	15.10.30	14	5,978	4·81	287·81	230	Jr. 2	
Chester, E. L., Mt. Scobie (Jersey)	1	1	Holmlea Myrtle ..	28542	28.11.30	12½	4,970	5·69	282·63	250	Sr. 2	234
Chirnside, J. P. Oakleigh (Jersey)	1	1	Werribee Island Fancy Madeira 2nd	16228	12.11.30	17	8,012	5·22	418·30	350	Mature	513, 517
Chirnside, R. M., Whittlesea (Jersey)	3	3	Mornmoot Melody ..	28558	1.10.30	18	6,342	6·71	425·29	230	Jr. 2	
			Mornmoot Mannette ..	28552	30.11.30	N.o.c.	4,976	5·83	289·92	230	Jr. 2	
			Fuchsia 9th of St. Albans	21586	23.12.30	20	8,966	4·95	444·07	330	Sr. 4	394, 428

* 240 days in Test. † 210 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Chitty, C., Kernot (Jersey)	8	7	Meridale Fairy ..	25839	28.9.30	6	5,211	5·84	304·41	290	Sr. 3	
			Holly of Meridale ..	16365	7.10.30	7	6,995	5·25	367·09	350	Mature	371, 340
			Aveley Attraction 5th	Vol. 18	9.10.30	4½	4,074	5·60	228·32	230	Jr. 2	
			Ewelme Master's Holly	Vol. 18	9.10.30	5½	5,465	6·21	339·38	230	Jr. 2	
			Ewelme Connoisseurs Choice	Vol. 18	12.10.30	11	6,245	6·00	374·63	230	Jr. 2	
			Glen Iris Brown Rose	25301	13.10.30	7	7,386	5·99	442·36	310	Jr. 4	309, 315
			Ewelme Gold Dawn	28563	19.10.30	14½	6,884	5·53	380·40	250	Sr. 2	340
			Pearl 11th of Meridale	16368	20.10.30	7	5,754	6·17	355·03	350	Mature	332, 387
Clark, P. W., Whittlesea (Jersey)	1	1	Coodardy Gloria ..	C.R.	27.9.30	14	5,492	6·35	348·64	230	Jr. 2	
Clark, W. J., Monomeith (Jersey)	2	2	Murta Betty ..	28576	23.10.30	15½	8,129	4·24	344·69	270	Jr. 3	320
			Glenavon Diana 2nd ..	28573	25.11.30	15	5,905	5·33	314·82	230	Jr. 2	
Clyne, J., Upper Maffra West (Jersey)	12	9	Fuchsia 2nd of Swansea	21190	2.10.30	17	6,337	5·60	354·74	350	Mature	230, 398, 342
			Paisley Foxglove ..	Vol. 18	4.10.30	14½	5,106	5·90	301·30	230	Jr. 2	
			Petal of Paisley ..	17722	4.10.30	21½	7,658	5·01	383·83	350	Mature	397, 431, 419
			Beauty 4th of St. Albans	15440	15.10.30	27	10,874	5·44	591·85	350	Mature	273, 485, 598, 548
			Jersey Vale Verbena ..	25321	23.10.30	18½	6,905	5·28	364·62	270	Jr. 3	276
			Paisley Miss Petal ..	Vol. 18	28.10.30	18	5,502	4·86	267·51	230	Jr. 2	
			Mistletoe of Swansea ..	21193	2.11.30	19	8,502	5·43	461·95	350	Mature	341, 466, 499
			Swansea Fuchsia 3rd ..	24299	20.11.30	15	7,758	4·97	385·92	310	Jr. 4	316, 399
			Lassie of Elouera ..	12236	2.12.30	15½	5,420	5·68	307·98	350	Mature	401, 409, 389, 417, 411
			Paisley Coral ..	21187	8.12.30	13½	5,862	5·36	314·38	350	Mature	203, 295, 352
			Flossie of Swansea ..	21188	15.12.30	18	5,703	5·51	314·48	330	Sr. 4	200, 312, 362
			Ipomea 2nd of Swansea	21191	16.12.30	20½	7,731	5·37	415·49	350	Mature	307, 427, 491
Cockbill Bros., Bacchus Marsh (Ayrshire)	8	4	Fulham Ada ..	17931	28 9.30	8½	6,992	3·94	275·60	270	Jr. 3	275
			Fulham Toddler ..	13338	28.9.30	21½	11,631	4·05	470·78	350	Mature	301, 184, 367, 394
			Fulham Velox ..	14647	16.10.30	11½	8,876	4·79	425·02	350	Mature	310, 359, 365
			*Fulham Goodyear ..	17935	26.10.30	4	4,920	4·41	216·95	270	Jr. 3	299
			Oakbank Bide-a-wee ..	15210	3.11.30	16½	8,180	4·07	332·71	350	Mature	307, 369
			Shamrock of Warrook	11084	24.11.30	7½	7,109	3.94	280·30	350	Mature	371
			Fairy 2nd of Warrook	9175	27.11.30	10½	7,310	4·01	292·85	350	Mature	
			Fulham Model ..	14645	28.11.30	14	7,670	4·63	355·20	350	Mature	273, 348, 323
Cockbill Bros., Rockbank (Ayrshire)	4	2	Fulham Bona ..	20018	19.10.30	20	7,640	4·28	326·81	230	Jr. 2	
			†Fulham Carrie ..	17933	20.10.30	4	1,553	4·80	74·61	270	Jr. 3	187
			‡Fulham Grace ..	17936	22.10.30	4	5,220	3·86	201·46	270	Jr. 3	225
			Fulham Topic ..	20029	23.12.30	19½	6,797	4·55	309·11	230	Jr. 2	
Cockbill Bros., Tongala (Ayrshire)	7	1	Fulham Allison ..	20017	2.11.30	9½	4,679	4·17	195·13	350	Mature	
			Fulham Louise ..	20023	6.11.30	13	5,751	4·09	235·42	230	Jr. 2	
			Fulham Lucy ..	13335	28.11.30	11	5,577	3·53	197·02	350	Mature	273, 255, 190, 190, 228
			Fulham Verna ..	17940	29.11.30	15½	5,793	4·20	243·56	250	Sr. 2	
			‡Fulham Laura ..	20022	10.12.30	4	3,060	4·37	133·59	230	Jr. 2	
			‡Fulham Beauty ..	10902	10.12.30	4	5,115	3·68	188·22	350	Mature	225, 325, 266, 227, 264
			Fulham Beatrice ..	17932	10.12.30	16	5,324	4·01	213·67	270	Jr. 3	
Cook, D. E., Loch (Jersey)	3	1	Olive Branch of Banyule	7126	30.9.30	15	7,308	4·74	346·16	350	Mature	257, 310, 318, 354
			Wattle Vale Pride's Treasure	Vol. 18	30.11.30	11	3,688	5·80	213·78	230	Jr. 2	
			Wattle Vale Pride's Deer	28587	3.12.30	12	5,861	5·54	324·94	230	Jr. 2	
Cook, J., Toora (Jersey)	1	1	Wood Aurora ..	25810	27.9.30	12	5,783	5·80	335·48	270	Jr. 3	248

* 240 days in Test. † 90 days in Test. ‡ 210 days in Test.

Standard Herd Records—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Cooper, H. A., Trafalgar (Jersey)	5	5	Glenloch Chorus Maid	24311	2.10.30	20	8,876	5·66	502·13	270	Jr. 3	328
			Glenloch Pearl ..	23043	5.10.30	24½	9,584	6·09	583·38	290	Sr. 3	334, 491
			Glenloch Royal Lass ..	28602	5·10.30	7	4,596	6·35	291·91	230	Jr. 2	
			Glenloch Mi Lady ..	24313	6.10.30	8¼	4,091	6·55	267·76	230	Jr. 2	
			*Glenloch Mabel ..	24312	11.10.30	4	4,950	6·35	314·39	270	Jr. 3	240
Coughlin, C., Catani (Jersey)	4	1	Gaiety Girl 15th of Melrose	16786	14.10.30	11½	6,030	5·45	328·69	350	Mature	217, 290, 264, 371, 372, 281
			Dianthus of Dalebank	16794	15.10.30	22	7,584	5·25	397·96	350	Mature	
			Aveley Lilian ..	22951	19.10.30	12	5,819	4·61	268·53	350	Mature	319, 314
			Burnside Melody ..	16937	4.11.30	15	7,229	4·60	332·81	350	Mature	303, 286
Cowling, W., Mornington (Jersey)	4	4	Edmonton Vixen ..	23050	29.9.30	22½	9,503	5·73	544·13	350	Mature	493, 502
			Cherry 13th of Melrose	11775	16.11.30	19½	10,071	5·25	528·44	350	Mature	285, 396, 493, 419, 535, 529
			Edmonton Fuchsia 4th	23046	27.11.30	19½	8,100	5·13	415·63	350	Mature	308, 401, 370
			Edmonton Fuchsia 5th	24314	3.12.30	15	7,412	6·24	462·48	350	Mature	378, 375
Cox, A., Mt. Scobie (Jersey)	11	11	Tavistock Peerless ..	28613	28.9.30	14½	7,394	5·17	382·10	270	Jr. 3	300
			Tavistock Graceful Duchess	Vol. 18	1.10.30	12	4,791	5·04	241·61	230	Jr. 2	
			Tavistock Myrtle ..	Vol. 18	14.10.30	13	4,646	5·66	262·79	230	Jr. 2	
			Audrey's Melba of Tavistock	18454	22.10.30	16	8,979	5·29	474·97	350	Mature	345, 440
			Tavistock Faith ..	28606	2.11.30	16½	7,070	4·73	334·39	250	Sr. 2	260
			Tavistock Rose ..	28614	11.11.30	16½	5,868	6·28	368·64	250	Sr. 2	271
			Honesty of Kameruka	12064	19.11.30	25	8,856	5·72	506·71	350	Mature	434, 530
			Tavistock Pettibelle ..	Vol. 18	23.11.30	14½	4,430	5·55	245·79	230	Jr. 2	
			Tavistock Patty ..	25819	10.12.30	12½	5,558	5·79	321·69	290	Sr. 3	299
			Tavistock Faithful ..	23055	22.12.30	25	9,926	4·85	481·58	330	Sr. 4	443
			Audrey's Pearl of Tavistock	18673	23.12.30	19	7,796	5·44	423·81	350	Mature	463
Davis, E. E., Bass (Jersey)	1	1	Blackwood Grove Perfection	24323	28.9.30	15	7,652	4·59	351·14	290	Sr. 3	229
Day, E., Penshurst (Jersey)	2	1	Viewpoint Sunlight ..	28643	2.10.30	12	4,551	5·33	242·42	230	Jr. 2	
			Viewpoint Princess ..	28642	15.11.30	5	2,399	5·40	129·61	230	Jr. 2	
Dee, J., Clyde North (Jersey)	4	2	Clydevale Lady Pearl ..	24331	20.10.30	12	5,528	4·99	275·81	290	Sr. 3	205
			Maitland Petal of Clydevale	21246	9.11.30	10	6,284	5·29	332·32	350	Mature	382, 392
			Clydevale Cora ..	24329	19.11.30	10	6,366	5·43	345·69	310	Jr. 4	255, 336
			Clydevale Daphne ..	24330	22.11.30	9½	5,711	5·66	323·28	270	Jr. 3	244
Department of Agriculture, Werribee (Friesian)	3	2	Victoria Top Notch ..	3267	28.9.30	22½	12,353	3·61	445·85	290	Sr. 3	377
			Victoria Soprano ..	3265	27.11.30	34	10,764	3·45	371·72	230	Jr. 2	
			Victoria Pattibelle ..	1707	9.12.30	5	5,250	3·53	185·43	350	Mature	274, 313, 460
Department of Agriculture, Werribee (Red Poll)	14	9	Victoria White Rose ..	1523AA	30.9.30	..	7,403	4·07	301·67	330	Sr. 4	294
			Victoria Balmy Breeze	2302A	3.10.30	21½	8,298	4·14	343·26	290	Sr. 3	351
			Victoria Queen Bess ..	2432B	9.10.30	12½	4,540	4·69	212·91	250	Sr. 2	
			Victoria Piquant ..	2330A	14.10.30	15	5,957	4·61	274·73	230	Jr. 2	
			Victoria Amara ..	1649A	21.10.30	26½	10,458	4·43	463·74	350	Mature	321, 415, 445,
			Victoria Cross ..	2313A	26.10.30	14	6,608	4·51	298·02	290	Sr. 3	338
			Victoria Amarylis ..	2301A	28.10.30	15½	5,135	4·98	255·60	230	Jr. 2	
			Victoria Vesuvius ..	2344A	31.10.30	14½	5,759	3·99	230·06	230	Jr. 2	
			Victoria Longbird ..	1158A	5.11.30	18	7,823	4·30	336·19	350	Mature	306, 249, 376, 389
			Victoria Korua ..	2322A	11.11.30	13	4,509	5·14	231·54	250	Sr. 2	
			Victoria Court Belle ..	2089AA	15.11.30	11½	3,834	4·41	168·96	230	Jr. 2	
			Victoria Cutaway ..	1241B	6.12.30	20½	9,335	4·05	378·37	350	Mature	248, 300, 356, 400
			Victoria War Ghost ..	2347A	17.12.30	31½	10,725	4·25	456·21	290	Sr. 3	372
			Victoria Guilder ..	2430B	24.12.30	17½	7,053	4·40	310·18	290	Sr. 3	346

* 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Desmond, J. J., Rochester (Jersey)	1	1	Preston Countess 2nd..	25353	19.10.30	20½	8,401	4·37	367·36	290	Sr. 3	279, 347
de Soyres Bros., Kyabram (Jersey)	1	1	Rosemont Fancy ..	23306	26.9.30	17½	7,328	5·07	371·22	350	Mature	438
Dickinson Bros., Sebastopol (Friesian)	5	3	Ashby Phyllis 5th ..	1171	12.11.30	23	11,268	3·18	357·94	350	Mature	308, 312, 370, 352
			Pauline 3rd of Ashby	1002	20.11.30	5½	11,739	2·84	332·82	350	Mature	260, 255, 318, 345, 437, 304
			Ashby Queenie 3rd ..	1172	23.11.30	29½	12,228	3·68	450·31	350	Mature	338, 382, 424, 526, 422
			Bonny Jean 2nd of Ashby	1003	27.11.30	14½	9,398	3·29	308·98	350	Mature	364, 418, 328
			Ashby Patricia Pauline	1168	26.12.30	40	12,118	3·41	413·72	350	Mature	344, 374, 389
Dobson, R. J. M., Acheron (Jersey)	5	5	Wattle Grove Jeanette	25840	1.10.30	18	7,425	4·89	363·40	270	Jr. 3	314
			Pine Grove Jewel ..	28381	3.10.30	19½	7,570	4·75	359·89	230	Jr. 2	
			Wattle Grove Sunbeam	25844	25.10.30	20	9,047	4·35	393·13	270	Jr. 3	386
			Wattle Grove Jean ..	21256	27.11.30	14½	8,472	5·13	434·45	350	Mature	280, 403
			Mundroola Lady Jennawarra	18690	6.12.30	23	8,291	5·09	422·27	350	Mature	356, 490
Dookie Agricultural College, Dookie (Ayrshire)	1	1	Dookie Sapphire ..	14720	15.12.30	30	10,797	3·92	423·01	350	Mature	330, 323, 381
Dowel, L. G., Jumbunna (Jersey)	4	2	Allawa Duchess ..	C.R.	13.10.30	13	5,663	5·58	315·96	230	Jr. 2	
			*Duchess of Wattle Vale	10177	17.10.30	4	6,678	4·69	313·32	350	Mature	
			†Wattle Vale Starbright	Vol. 18	30.10.30	4	5,160	4·85	250·25	350	Mature	
			Callemondah Sunshine	C.R.	7.12.30	11½	5,520	5·59	308·78	230	Jr. 2	
Dowie, A. F., Carisbrook (Jersey)	1	1	Mabel's Petal 3rd of Banyule	14187	14.10.30	22	7,835	5·23	409·57	350	Mature	307
Ducat, P. J., and Sons, Ardmona (Jersey)	6	5	Airlie Beauty 3rd ..	28670	5.10.30	13⅝	5,768	5·28	304·37	230	Jr. 2	
			Airlie Mermaid 2nd ..	Vol. 18	17.11.30	10½	5,519	5·71	315·24	230	Jr. 2	
			Airlie Mermaid ..	25848	22.11.30	23½	9,132	4·94	451·31	350	Mature	309, 390
			Airlie Duchess ..	Vol. 18	24.11.30	12½	5,094	5·62	286·13	270	Jr. 3	
			Airlie Buttercup 6th ..	Vol. 18	26.11.30	13	4,344	4·94	214·71	230	Jr. 2	
			Handsome Girl of Airlie	18696	22.12.30	10½	7,289	5·43	395·75	350	Mature	247, 324, 451
Dunbar Bros., Carlsruhe (Friesian)	2	..	Wimmera Wynette ..	Vol. 11	28.9.30	10	7,323	3·13	229·41	230	Jr. 2	
			Wimmera Judith ..	Vol. 11	29.9.30	12	9,036	3·05	275·88	290	Sr. 3	215
Dwyer, G., Balwyn (Jersey)	1	..	Yurla Buttercup Larkspur	Vol. 18	2.11.30	10½	4,365	4·79	209·29	230	Jr. 2	
Edwards, T. J., Myrtlebank (Jersey)	3	3	Sunny Brae Poppy ..	26364	29.9.30	13	6,194	5·72	354·39	250	Sr. 2	237
			Chandos Masterpiece's Duchess	Vol. 18	24.10.30	14½	4,417	5·80	256·02	230	Jr. 2	
			Sunny Brae Rosetta 2nd	25365	1.12.30	28	7,644	5·36	410·07	270	Jr. 3	344
Enders, A. E., Stanhope (Friesian)	3	3	‡Burnbank Segis Matador	Vol. 11	26.10.30	4	9,915	3·15	312·16	290	Sr. 3	347
			Burnbank Fraulein Patch	3029	7.11.30	35	14,857	3·62	537·33	310	Jr. 4	460, 451
			Burnbank Netherland Woodcrest	Vol. 18	20.12.30	41	13,095	2·98	390·88	290	Sr. 3	406
Enders, N. H., Stanhope (Jersey)	4	4	The Wattles Gipsy Queen	Vol. 18	11.10.30	17	6,201	5·82	360·96	230	Jr. 2	
			Jubilee Witch Hazel ..	18940	14.11.30	26½	10,188	5·14	523·76	350	Mature	
			Buttercup of the Wattles	12910	24.11.30	19	8,655	5·42	468·99	350	Mature	430, 528, 551
			The Wattles Princess Elizabeth	25871	27.11.30	22½	8.521	5·22	445·05	290	Sr. 3	295, 324

* 269 days in Test. † 210 days in Test. ‡ 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Esler, G., Tongala (Jersey)	5	5	Maiwand Petunia ..	28692	27.9.30	N.O.C.	5,156	4·65	239·70	230	Jr. 2	
			Maiwand Blossom 2nd	23127	10.10.30	4	7,055	4·70	331·89	330	Sr. 4	261, 333, 356
			Maiwand Buttercup ..	28688	25.10.30	4	5,784	4·46	258·04	230	Jr. 2	
			Maiwand Daisy ..	25875	31.10.30	16½	9,186	5·01	459·93	310	Jr. 4	370, 392
			Maiwand Holly ..	28690	31.10.30	12½	6,738	5·20	350·68	230	Jr. 2	
Evans, A., Heywood (Jersey)	3	2	Boronia Farm Dainty Lass	C.R.	30 9.30	11	4,678	6·13	286·68	230	Jr. 2	
			Kelvin Brook Lotus ..	C.R.	29.10.30	15	5,793	5·56	321·86	230	Jr. 2	
			Boronia Farm Queenie	21267	3.11.30	11½	4,880	5·80	283·00	310	Jr. 4	262, 196
Fairchild and Clutterbuck, Tinamba (Jersey)	2	1	Vaucluse Kirsty ..	Vol. 18	20.12.30	10½	3,588	5·88	210·83	230	Jr. 2	
			Vaucluse Blossom ..	Vol. 18	22.12.30	11	4,095	5·96	244·22	230	Jr. 2	
Findlay, G., Leitchville (Jersey)	7	6	Twylish Perree of Leven Brae	21276	26.10.30	18½	7,859	5·21	409·11	350	Mature	229, 357, 483, 418
			Lady Grey of Colac ..	21275	2.11.30	13½	6,830	4·99	340·92	350	Mature	236, 351, 390, 440
			Leven Brae Empress ..	Vol. 18	6.11.30	13½	7,230	4·39	317·61	270	Jr. 3	309
			Leven Brae Twylish's Princess	Vol. 18	15.11.30	24½	8,967	4·04	361·98	350	Mature	214, 231, 324, 335
			Leven Brae Rosebud ..	Vol. 18	1.12.30	17½	6,566	4·69	308·25	270	Jr. 3	262
			Leven Brae Sweetness	25886	7.12.30	14	5,820	5·06	294·28	290	Sr. 3	320
			Leven Brae Gay's Fancy ..		18.12.30	23	6,102	4·55	277·60	230	Jr. 2	
Findlay, T. R., Leitchville (Jersey)	7	6	Leven Brae Lal Grey ..	23135	12.10.30	21	8,931	5·19	463·28	330	Sr. 4	307, 320, 352
			Rose of Colac ..	14986	13.10.30	15	8,133	5·52	448·71	350	Mature	303, 333, 368, 414
			Leven Brae Daisy Grey	Vol. 18	27.10.30	13½	6,622	5·76	381·67	270	Jr. 3	309
			Leven Brae Joyce ..	Vol. 18	3.11.30	14	4,739	5·51	260·97	250	Sr. 2	
			Leven Brae Fancy Madeira	25885	4.11.30	21	7,718	4·50	347·07	270	Jr. 3	240, 329
			Lady Grey 22nd of St. Albans	13345	18.11.30	16½	7,022	4·47	314·05	350	Mature	226, 350, 289, 361, 412, 365
			Leven Brae Queen ..	23139	26.11.30	14	6,747	5·76	388·45	330	Sr. 4	335, 422, 406
Fisken, A. C., Yendon (Dairy Shorthorn)	1	..	*Poplar Vale Princess 193rd	Vol. 1	27.11.30	4	4,215	4·02	169·50	310	Jr. 4	171
Fixter, A., Boisdale (Guernsey)	4	3	Fernlea Rosebud ..	2681	22.10.30	14	6,330	5·43	343·96	250	Sr. 2	285
			Daffodil's Heiress of Mincha Vale	822	7.12.30	12½	5,663	4·88	276·14	350	Mature	269, 312
			Fernlea Daffodil ..	2679	19.12.30	11½	5,964	5·47	326·14	250	Sr. 2	290
			Mincha Vale Daphne ..	2682	21.12.30	17½	6,927	5·48	379·39	350	Mature	346, 371
Fixter, W. A. Boisdale (Jersey)	3	2	Olivedale Queenie ..	24352	2.11.30	12	6,204	5·41	335·68	310	Jr. 4	312, 309
			Studleigh Dianthus 4th	25288	4.11.30	12	5,637	5·52	311·21	250	Sr. 2	303
			Studleigh Wyandotte's Cream	25297	6.11.30	8½	4,029	5·65	227·72	250	Sr. 2	209
Foster Bros., Boisdale (Jersey)	5	..	Kingsvale Canary 21st	24206	1.11.30	13	6,075	5·66	343·68	310	Jr. 4	283, 357
			Kirkhill Leila ..	23147	5.11.30	14½	6,197	5·11	316·74	310	Jr. 4	315, 312
			Ballara Madeira ..	23145	11.12.30	13½	6,331	5·67	359·02	310	Jr. 4	302, 309
			Heather 3rd of Springhurst	18931	12.12.30	30	8,310	4·73	393·13	350	Mature	316, 364, 437
			Hazeldale Moonshine ..	29121	25.12.30	16½	6,930	5·45	377·94	270	Jr. 3	350
Fraser, G. A., Addington (Ayrshire)	4	2	Bonnie Doon Alice ..	19570	11.10.30	20	6,804	4·12	280·48	230	Jr. 2	
			†Craigielea Daphne ..	17682	15.10.30	4	5,220	3·77	196·99	270	Jr. 3	240
			Roxburgh Graceful 2nd	16597	18.10.30	5½	6,750	4·21	283·87	310	Jr. 4	299
			Craigielea Sylvia ..	17686	22.11.30	13½	5,967	4·34	258·82	250	Sr. 2	326
Freestone, P. A., Murchison (Jersey)	2	2	Jerseyvale Doris ..	24535	7.11.30	14½	7,587	4·91	372·55	310	Jr. 4	287, 348
			†Jerseyvale Princess 3rd	29281	9.12.30	4	5,280	4·81	254·23	250	Sr. 2	249

* 240 days in Test. † 210 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Gange, Mrs. E. M., Werribee (Ayrshire)	1	..	*Roseleigh Rosebloom	16582	4.10.30	4	8,469	4·10	347·12	350	Mature	257, 265, 395
Gardener, J. L., Welshpool (Jersey)	4	4	Lauriston Noble Belle	28705	29.9.30	9	4,880	5·00	244·22	230	Jr. 2	
			Golden Belle of Whare Koa	12957	3.10.30	16½	7,351	5·45	400·58	350	Mature	327, 345, 385, 371
			Lotus Queen of Whare Koa	14153	28.10.30	12½	8,141	5·12	416·75	350	Mature	290, 317, 371, 324, 371
			Daisy Belle of Whare Koa	14152	2.11.30	15	7,443	4·74	352·99	350	Mature	258, 310, 300, 312, 373, 361
Gibson Bros., Trafalgar (Jersey)	4	4	Leathorne Laurette ..	Vol. 18	29.9.30	13	5,844	5·50	321·30	230	Jr. 2	
			Leathorne Lilac ..	23163	10.10.30	20½	6,998	5·40	377·56	350	Mature	318, 383, 421
			Leathorne Easter Daisy	Vol. 18	13.10.30	8½	4,991	6·03	300·82	250	Sr. 2	214
			Sweet Star of Glen Iris	14178	5.12.30	12	8,539	5·51	470·67	350	Mature	283, 337, 407, 375, 418
Gorman, A. W., Alexandra (Ayrshire)	2	2	Cathcart Poppy ..	15868	29.9.30	10	9,645	4·14	399·51	310	Jr. 4	258, 360
			Cathcart Melba ..	17494	12.11.30	17½	7,928	4·00	317·09	270	Jr. 3	224
Hall, E., Tongala (Jersey)	3	..	Jubilee Thyme ..	14149	29.9.30	8	5,244	5·38	282·32	350	Mature	356, 366, 509, 369, 478, 320
			Verbena of Melwood ..	17436	7.10.30	17	5,919	5·91	349·62	350	Mature	260, 356, 304, 341, 348
			Melwood Thelma 2nd	Vol. 18	8.11.30	6	2,864	5·80	166·00	230	Jr. 2	
Handbury, J., and Sons, Toora (Jersey)	2	2	Tooravale Princess 4th	28738	31.10.30	9	4,379	5·57	243·85	230	Jr. 2	
			Tooravale Lassie Fowler 5th	Vol. 18	4.12.30	9½	4,463	6·20	276·58	230	Jr. 2	
Handley, S. C., Dandenong (Jersey)	1	1	Hillcrest Village Maid..	25998	28.9.30	9½	7,281	4·72	343·42	330	Sr. 4	
Harker, D. C. Caldermeade (Ayrshire)	3	1	Thirlmere Precious ..	19073	14.11.30	13	5,396	4·32	233·16	250	Sr. 2	185
			Thirlmere Peggy ..	20780	16.11.30	8	5,405	4·27	231·03	230	Jr. 2	
			Poppy of Thirlmere ..	12211	17.11.30	12	7,149	4·07	291·02	350	Mature	223, 296, 290, 302
Harker, W. T., Caldermeade (Ayrshire)	8	1	†Allie of Sunnyside ..	12940	9.10.30	4	6,990	3·84	268·61	350	Mature	
			Winsome of Wayside ..	14911	10.10.30	8	8,067	3·96	319·07	350	Mature	215, 282
			Tinkle of Wayside ..	14908	14·10.30	6½	7,245	4·12	298·32	330	Sr. 4	282, 333
			†Coulcraggie Annie ..	14630	5.11.30	4	6,750	3·76	253·53	350	Mature	295
			Beauwarrin Ibex ..	17324	5.11.30	4½	4,902	3·66	179·58	270	Jr. 3	205
			Carnation of Wayside..	16899	18.11.30	13	9,246	3·80	351·62	350	Mature	245, 343, 358
			Wayside Connie ..	16900	28.11.30	12	6,368	4·55	289·73	310	Jr. 4	259, 293
			Dolly of Coulcraggie ..	13832	9.12.30	14	7,622	4·08	311·03	350	Mature	260
Harris, J. W., Clyde (Jersey)	1	1	Dingley Dell Mandoline	23200	23.11.30	13	6,101	5·86	357·36	310	Jr. 4	266, 330
Harrison, Miss K., Frankston (Jersey)	2	..	Donna of Somerville ..	17437	2.10.30	23½	7,899	4·26	336·44	350	Mature	242, 276, 230, 319
			Walbundry Alpha 2nd	28752	2.10.30	10	4,368	4·70	205·12	250	Sr. 2	155
Harvey, T., Boisdale (Jersey)	5	5	Jerseyholm Bluebell 7th	23202	3.10.30	14	6,187	5·47	338·38	310	Jr. 4	310, 347
			Jerseyholm Bluebell 8th	25393	30.10.30	14	4,943	6·00	296·70	270	Jr. 3	
			Jerseyholm Kirsty 23rd	25401	13.11.30	15½	4,725	5·86	276·85	250	Sr. 2	
			Jerseyholm Empress 13th	25398	17.11.30	16½	6,021	5·61	337·59	250	Sr. 2	
			Kirsty 16th of Jerseyholm	18736	5.12.30	15½	7,073	5·81	411·00	350	Mature	351, 433, 455, 455

* 253 days in Test. † 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Hayes, E. P., Loch (Jersey)	1	1	Daisy 19th of Melrose	19976	9.11.30	15½	6,885	5·77	397·27	350	Mature	228, 334
Henderson, W., Dennington (Ayrshire)	4	0	Carracoorte Viola 13th	19740	2.10.30	12½	4,218	4·48	189·14	230	Jr. 2	
			Fennella 7th of Carracoorte	9355	23.11.30	16½	7,386	3·92	289·90	350	Mature	232, 229, 188, 325, 402, 314, 348
			Carracoorte Rosebloom 11th	21134	12.12.30	10½	5,787	4·32	249·84	350	Mature	156, 249, 243
			Dairylass 2nd of Carracoorte	9348	26.12.30	10½	6,579	4·16	273·61	350	Mature	364, 246, 325, 264, 290
Henderson, W., Grasmere (Ayrshire)	8	3	*Carracoorte Iris 10th ..	19695	28.9.30	4	4,080	3·61	147·21	230	Jr. 2	
			Carracoorte Brownie's Pet	21130	2.10.30	9½	5,367	4·93	264·66	310	Jr. 4	307
			Carracoorte Brownell 2nd	22586	3.10.30	N.O.C.	5,460	4·99	272·56	270	Jr. 3	
			†Carracoorte Brownie 16th	19683	7.10.30	4	4,290	4·29	183·85	230	Jr. 2	
			Carracoorte Bellona 10th	17441	10.10.30	12	6,202	4·66	288.89	270	Jr. 3	311
			Bunty 3rd of Carracoorte	9330	11.10.30	12½	7,652	4·39	336·29	350	Mature	208, 341, 389, 195, 312, 402, 366, 444
			‡Carracoorte Balm 11th	19679	22.10.30	4	2,445	3·68	89·99	230	Jr. 2	
			Carracoorte Bunty 11th	17455	3.11.30	19½	6,381	4·36	278·48	270	Jr. 3	262
Herd, L. J. Heidelberg (Jersey)	5	4	Aveley Norma 3rd ..	25411	23.10.30	13	7,031	5·09	357·82	270	Jr. 3	293
			Berrington Soprano ..	28759	6.11.30	10	4,893	5·96	291·57	230	Jr. 2	
			Aveley Pearl 3rd ..	24225	23.11.30	8½	5,921	4·92	291·25	310	Jr. 4	244
			Aveley Leila	25232	3.12.30	17½	6,860	5·73	393·13	310	Jr. 4	324
			Banyarra Maid ..	28758	3.12.30	13½	4,854	5·19	252·02	230	Jr. 2	
Holbing, L. W. C., Tongala (Jersey)	1	1	Aveley Grevillea ..	24221	15.10.30	9	6,122	6·38	390·66	310	Jr. 4	325
Hore, L. G., Horefield (Illawarra Shorthorn)	3	..	§Melba 78th of Darbalara	Vol. 1	13.10.30	4	6,337	3·94	249·91	330	Sr. 4	
			§Aralabrae Madame ..	Vol. 1	13.10.30	4	5,115	3·85	196·81	270	Jr. 3	
			Kimo Virginia 5th ..	Vol. 1	19.11.30	13½	4,346	3·88	168·69	230	Jr. 2	
Howlett, E. H., Morwell (Jersey)	5	5	Latrobe Silvermine 5th	25424	18.10.30	12½	5,117	6·82	349·12	230	Jr. 2	
			Latrobe Statuette ..	25425	28.10.30	11	5,052	5·35	270·11	230	Jr. 2	
			Latrobe Dorothy 2nd	24397	31.10.30	13½	6,503	5·72	372·29	310	Jr. 4	
			Latrobe Lily 8th ..	25419	4.11.30	10½	5,132	5·80	297·79	230	Jr. 2	
			Latrobe Silvermine 4th	25423	1.12.30	8½	4,662	5·32	248·07	230	Jr. 2	
Hubbard, A., Yarra Glen (Ayrshire)	1	..	Emoh Ruo Sweetie ..	19927	31.10.30	15	5,339	3·81	203·48	250	Sr. 2	
Huffer, J. A., Gormandale (Jersey)	5	5	Glen Valley Waverley Lass 3rd	28761	15.10.30	11½	4,430	6·31	279·75	230	Jr. 2	
			Rosebud Perree's Fancy of Glen Valley	21357	19.10.30	24½	10,277	4·86	499·67	330	Mature	307, 411, 445
			Czarina of Glen Valley	18754	27.10.30	20	8,829	5·50	485·84	350	Mature	331, 399, 481
			Melrose Handsome Girl 14th	25697	22.11.30	13½	6,950	5·75	399·52	290	Sr. 3	217, 381
			Glen Valley Rosemary	24403	22.11.30	13½	6,846	5·55	379·66	310	Jr. 4	300, 349
Huggins, R. E., Bularook (Jersey)	2	2	Delmont Princess ..	28764	9.10.30	14½	5,807	4·95	287·50	230	Jr. 2	208
			Silvermine 40th of Banyule	18819	15.10.30	23	9,275	5·54	513·77	330	Sr. 4	331
Hurrey, W. H., Koonwarra (Jersey)	2	2	Kooroona Audrey 2nd	28773	3.10.30	12	5,621	5·40	303·41	230	Jr. 2	
			Kooroona Maranta 2nd	28775	22.10.30	6½	5,895	5·36	316·16	230	Jr. 2	

* 210 days in Test. † 240 days in Test. ‡ 150 days in Test. § 270 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Jakobi, L. W., Catani (Jersey)	2	1	Grangelea Daffodil 2nd	23002	7.11.30	13½	7,541	5·43	409·46	330	Sr. 4	434, 474
			Lorna of Latrobe ..	16658	15.11.30	16½	6,989	4·97	347·11	350	Mature	239, 296
Jephson, W. T., Stacey's Bridge (Jersey)	1	1	Elanora Orchid 2nd ..	Vol. 18	23.10.30	23	8,081	6·45	521·15	230	Jr. 2	
Kent, G. A., Archie's Creek (Ayrshire)	5	1	*Woolamai Picture ..	14999	4.10.30	4	5,580	4·27	238·47	350	Mature	241, 225
			Woolamai Bright ..	17012	18.10.30	7	7,769	4·42	343·40	290	Sr. 3	286
			Woolamai May ..	20899	3.11.30	4½	4,653	4·70	218·86	230	Jr. 2	
			Woolamai Pledge ..	17016	12.11.30	4½	5,850	4·37	255·46	310	Jr. 4	221, 324
			Woolamai Promise ..	20905	16.11.30	9½	5,098	4·33	220·99	230	Jr. 2	
King, H. W., Warragul (Jersey)	1	1	Karoola Honeybee ..	21389	1.12.30	22½	10,149	5·04	511·88	350	Mature	412, 426, 533
Knowles, T., Dandenong (Ayrshire)	8	6	Dandy Emma ..	19822	14.10.30	17½	5,621	4·31	242·36	230	Jr. 2	
			Fernhill Betty ..	15539	15.10.30	12½	11,067	4·50	497·53	350	Mature	300, 332, 421
			Beleura Solo 2nd ..	19513	20.10.30	8½	7,347	3·82	280·30	270	Jr. 3	354
			Beleura Petrel ..	19506	8.11.30	12½	7,056	3·89	274·79	270	Jr. 3	271
			Beleura Colleen 3rd ..	19481	18.11.30	16½	8,456	4·25	359·17	270	Jr. 3	314
			Fanny of Rosstrevor ..	13349	25.11.30	10	9,885	3·72	367·44	350	Mature	263, 297, 387, 379
			Dandy Palm ..	17729	5.12.30	5	4,964	4·56	226·41	270	Jr. 3	261
			Fortune of Olivedale ..	14040	25.12.30	17½	7,676	4·26	327·11	350	Mature	
Koenig Bros., Mooroopna North (Ayrshire)	3	1	†Borinya Winsome ..	17369	30.9.30	4	6,405	3·89	249·15	270	Jr. 3	309
			Wattle Park Elaine ..	19214	10.10.30	22½	7,845	3·73	292·41	310	Jr. 4	
			Oakbank Quince ..	15284	4.11.30	18½	9,500	4·22	401·16	350	Mature	388, 402
Lade, A., Alexandra (Jersey)	4	2	Hythe's Fairy ..	Vol. 18	7.10.30	9½	3,254	5·71	185·65	230	Jr. 2	
			Jess's Fancy of Glen Vale	21422	12.10.30	22½	7,461	5·18	386·13	350	Mature	309
			Glen Vale Holly ..	24448	4.12.30	20	6,267	6·43	402·81	310	Jr. 4	288
			Hythe's Buttercup ..	28812	24.12.30	13	3,872	5·41	209·51	270	Jr. 3	229
Lane, K. D., Merino (Jersey)	5	5	Wompini Masterman's Meg	25611	4.10.30	15½	5,811	6·07	352·50	290	Sr. 3	271
			Dalray Lady ..	26008	13.10.30	16½	7,294	5·52	402·99	270	Jr. 3	
			Larkspur's Princess of Dalray	15530	3.11.30	15½	6,467	5·89	381·17	350	Mature	454
			Haifa Topsy Lotus ..	29001	7.11.30	12	3,921	6·26	245·42	230	Jr. 2	
			Dalray Larkspur ..	Vol. 18	27.12.30	20½	4,827	5·77	278·49	230	Jr. 2	
Lawrence, P. H., Tarrawarra (Jersey)	1	1	Rainga Noble Leda ..	24441	4.10.30	11	5,492	6·57	360·97	270	Jr. 3	278
Lennie, Mrs. E. M., Tongala (Jersey)	4	3	The Valley Linda 5th	26020	21.10.30	19	5,919	4·21	249·42	270	Jr. 3	248
			The Valley Stumpy 2nd	26025	11.11.30	16	7,959	4·24	337·71	310	Jr. 4	284
			The Valley Black Rose	26017	1.12.30	19½	8,430	5·43	457·88	270	Jr. 3	299
			The Valley Merella 2nd	23259	14.12.50	17	7,536	5·38	405·14	330	Sr. 4	267, 372, 415
Longerenong Agricultural College, Dooen (Ayrshire)	2	1	Longerenong Wattle ..	15054	6.10.30	14	8,142	4·79	389·78	350	Mature	281, 294, 346
			Longerenong Gloria 2nd	20482	23.10.30	6½	4,506	4·82	217·22	270	Jr. 3	161
Lowing, Mrs. L., Tongala (Jersey)	3	3	Troed-yr-Rhiw Blodwen	26040	25.10.30	22	6,737	5·04	339·69	310	Jr. 4	
			Mystery 2nd of Belgonia	18858	2.11.30	21½	7,824	4·98	389·41	350	Mature	298, 331, 425
			Patricia of Jersey Vale	18886	18.11.30	20	5,942	6·15	365·44	350	Mature	217, 295, 449

* 210 days in Test. † 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Lyon, C. G., Heidelberg (Jersey)	10	10	Banyule Tiddlewinks 3rd	24473	1.10.30	25	9,349	5·05	471·89	290	Sr. 3	460
			Banyule Molly 29th ..	25462	4.10.30	23	7,571	4·61	349·23	250	Sr. 2	
			Banyule Lady Lotus ..	25461	15.10.30	19	6,060	5·34	323·35	230	Jr. 2	
			Banyule Molly 25th ..	24458	21.10.30	21½	7,988	5·54	442·58	290	Sr. 3	375
			Banyule Silvermine 55th	25473	28.10.30	21	6,891	5·84	402·77	230	Jr. 2	
			Banyule Tiddlewinks 4th	25477	30.10.30	15	5,195	6·10	317·04	230	Jr. 2	
			Banyule Silvermine 46th	24466	31.10.30	12½	7,214	5·57	401·56	290	Sr. 3	390
			Banyule Ettie 12th ..	25457	16.11.30	19½	6,421	5·85	375·50	230	Jr. 2	
			Banyule Silvermine 53rd	25471	20.11.30	24½	7,505	5·16	387·16	230	Jr. 2	
			Banyule Soprano 10th	25475	27.12.30	30	8,069	4·59	370·48	230	Jr. 2	
Macauley, C. W. W., Rochester (Jersey)	2	1	Taranah Roseleaf ..	23293	12.10.30	N.O.C.	7,113	5·99	426·05	350	Mature	292, 357, 381, 393
			Taranah Daisy ..	23291	25.12.30	N.O.C.	7,190	4·54	326·43	330	Sr. 4	204, 313
McDougall, J., Byaduk (Jersey)	3	3	Parkview Charm ..	24476	2.11.30	19½	7,617	4·63	353·01	310	Jr. 4	291
			Parkview Colleen ..	24477	19.11.30	14½	7,116	4·73	336·57	310	Jr. 4	295, 325
			Novelty of Parkview ..	17791	29.11.30	19	8,433	5·22	439·91	350	Mature	374, 398, 419, 468
McErvale, I., and Son, Camperdown (Jersey)	2	2	Cumnock Opal ..	23269	18.10.30	17	8,076	6·16	497·15	350	Mature	331, 408
			Cumnock Noble Duchess	25486	18.11.30	11	6,873	4·33	297·42	290	Sr. 3	262
G. A. McNabb and Son, Irrewillipe East (Jersey)	4	4	Cora of Linga Longa ..	15430	12.10.30	26	9,618	5.29	508·76	350	Mature	339, 367, 456, 491, 531, 539
			Ranunculus 2nd of Springhurst	18937	22.10.30	25	8,205	5·39	442·62	350	Mature	311, 368, 348
			Chief's Marie of Boorene	21104	26.10.30	25	10,325	4·62	476·65	350	Mature	452, 402
			Mercedes Belle 3rd of Avalon	18613	26.10.30	24	8,676	4·67	404.78	350	Mature	219, 164, 354
Mesdames McWhae and Silvester, Merino (Guernsey)	7	..	Talisker Dewy morn ..	..	11.10.30	7½	4,052	4·42	78·95	230	Jr. 2	
			Knightlea Favourite ..	1407	12.10.30	6½	6,645	4·83	321·15	330	Sr. 4	288, 211, 290
			Talisker Orama ..	2649	27.10.30	6½	3,729	4·89	182·40	230	Jr. 2	
			Minnamurra Sunbeam	1234	2.11.30	10	6,947	4·32	300·12	350	Mature	383, 274
			Talisker Clara ..	2645	28.11.30	8	3,716	4·86	180·59	230	Jr. 2	
			Talisker Ariel ..	2216	8.12.30	10	4,856	4·72	229·38	230	Jr. 2	
			Talisker Sunray ..	2650	26.12.30	13½	4,151	4·11	170·51	230	Jr. 2	
Mailer, Dr. R., Shepparton (Jersey)	8	4	Gem 2nd of Coolwoola	19970	1.10.30	16½	7,467	5·00	373·45	350	Mature	360, 389
			*Maneroo Daphne 4ths Lass	29102	13.10.30	4	5,767	5·92	341·32	250	Sr. 2	235
			*Violet Vale Hope ..	24423	15.10.30	4	4,875	5·22	254·52	290	Sr. 3	275
			*Maneroo Daphne 2nds Lass	29101	16.10.30	4	4,680	5·50	257·52	270	Jr. 3	224
			Maneroo Margaret's Favourite Lass	26070	24.10.30	5	4,589	5·18	237·87	290	Sr. 3	233, 248
			Maneroo Lady Marge's Marguerite	Vol. 18	27.10.30	6½	4,637	5·75	266·78	230	Jr. 2	
			Maneroo Marge's Lass	29103	12.11.30	18	4,916	5·38	264·70	270	Jr. 3	263
			Maneroo Daphne 2nds Anne Boleyn	Vol. 18	12.12.30	16½	4,260	5·67	241·71	230	Jr. 2	
Mapleson A. J., Jindivick (Jersey)	1	1	Hazeldale Jessie's Charm	25552	3.10.30	12½	5,702	6·17	351·68	310	Jr. 4	302, 358
Marshman, A. R., Archie's Creek (Jersey)	6	1	Forgan Fairy ..	29127	29.9.30	10½	5,621	5·02	281·96	250	Sr. 2	234
			Forgan Ladylike ..	29128	14.10.30	10½	4,998	5·32	266·09	270	Jr. 3	257
			Forgan Melody ..	Vol. 18	15.11.30	5	3,765	4·86	183·00	230	Jr. 2	
			Forgan Pansy ..	Vol. 18	16.11.30	N.O.C.	3,002	5·41	162·36	230	Jr. 2	
			*Forgan Curiosity ..	Vol. 18	20.11.30	4	2,880	5·58	160·70	230	Jr. 2	
			*Forgan Pride ..	Vol. 18	1.12.30	4	2,970	5·45	161·77	230	Jr. 2	
Masters, R., Swan Hill (Ayrshire)	3	1	*Beattie 5th of Sunnyside	7989	3.10.30	4	6,375	3·25	207·44	350	Mature	
			Meadow Lass of Sunnyside	13005	29.10.30	7	9,909	3·62	358·81	350	Mature	452, 394
			Grand View Melba 2nd	21704	7.12.30	20	6,075	3·54	214·89	230	Jr. 2	

* 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Meadowcroft, S., Stanhope (Jersey)	2	1	Irymple Lovely ..	Vol. 18	8.10.30	9	3,494	5·48	191·46	230	Jr. 2	
			Aveley Mist	Vol. 18	18.10.30	12	5,408	6·16	332·89	230	Jr. 2	
Mosley, T., Dalyston (Jersey)	3	3	Warenda Mandoline 3rd	29151	2.10.30	18	8,228	5·98	491·65	270	Jr. 3	375
			Meadow Queen of Warenda	17805	23.11.30	17	7,136	5·07	362·09	350	Mature	322, 313, 343, 387, 477
			Warenda Gazelle 7th ..	29150	16.12.30	18	6,237	6·77	422·54	270	Jr. 3	401
Middleton, E. A., Hamilton (Jersey)	4	3	Castlemaddie Hawthorn	29157	2.10.30	15	5,070	6·65	336·99	290	Sr. 3	316
			Cornflower of Castlemaddie	16718	2.10.30	15½	6,228	4·67	290·80	350	Mature	372
			Ear Park Sweet Nell ..	Vol. 18	16.11.30	19½	5,745	5·06	290·88	230	Jr. 2	
			Clover Flat Semiramis	29205	19.11.30	17	6,315	5·60	353·87	350	Mature	
Moore, J. and Co., Yarram (Jersey)	8	5	Antimony's Trixie of Belle Vue	15569	2.10.30	15	9,334	4·93	460·25	350	Mature	479
			Tooloonook Bessie 3rd	C.R.	6.10.30	6½	4,481	5·48	245·44	230	Jr. 2	
			Clianthus 2nd of Springhurst	16962	12.10.30	10½	7,866	5·39	423·91	350	Mature	298
			Heather 2nd of Springhurst	16961	20.10.30	15	7,445	4·60	342·78	350	Mature	289
			Tooloonook Trixie 3rd	25570	22.10.30	9½	5,390	4·76	256·35	290	Sr. 3	218
			*Tooloonook Trixie 5th	C.R.	31.10.30	4	4,508	5·19	233·76	250	Sr. 2	144
			Comely Banks Peach ..	25564	12.11.30	13	7,481	5·93	443·38	330	Sr. 4	346
			Tooloonook Boltonia ..	Vol. 18	25.11.30	4½	4,820	6·10	294·09	270	Jr. 3	214
Muhlebark Estate, W. J. Batesford (Ayrshire)	1	..	Oakbank Adelaide ..	29512	23.10.30	10½	4,896	4·15	203·38	230	Jr. 2	
Neave, E. B., Callignee (Jersey)	3	2	Brightside Sweet Pearl	29196	19.10.30	18½	7,523	5·19	390·08	250	Sr. 2	
			Starfinch of Latrobe ..	21353	6.11.30	26	10,788	5·29	570·74	330	Sr. 4	414
			Elimatta All Eyes ..	26434	30.11.30	5	4,583	5·22	239·18	290	Sr. 3	
Nicholls, E., Springhurst (Jersey)	1	..	Pearl of Blowering ..	21539	10.10.30	15½	8,279	4·19	347·11	350	Mature	303, 273, 306
Nolte, E. H., Merino (Jersey)	2	1	Nairana Cloth of Gold	29225	22.10.30	16	6,932	6·53	452·70	310	Jr. 4	
			Nairana Virginia 2nd ..	29268	17.11.30	13	5,109	5·28	269·89	310	Jr. 4	
O'Meara, B. R., Caldermeade (Ayrshire)	2	1	Scotsville Sylvia's Pet	18909	30.10.30	5½	7,587	3·93	298·04	290	Sr. 3	336, 365
			Scotsville Mona ..	20725	24.11.30	7½	5,285	4·12	217·48	250	Sr. 2	352
Onley, W. H., Caldermeade (Ayrshire)	2	..	Holm Laurette ..	20349	1.11.30	12	6,425	3·36	215·96	230	Jr. 2	
			Holm Boronia ..	20346	16.11.30	10½	5,075	4·30	218·01	230	Jr. 2	
Osborne, H., Poowong (Jersey)	3	..	Grangelea Dainty 2nd	23003	4.11.30	9½	6,882	5·04	346·84	350	Mature	373, 427
			†Grangelea Bunty 2nd	24272	12.11.30	4	5,693	5·52	314·20	330	Sr. 4	357
			Grangelea Rosebud 4th	26393	15.12.30	6	4,539	5·39	244·60	270	Jr. 3	
Parbury, W., Warburton (Jersey)	5	3	Brookfield Verbena 15th	29296	29.9.30	15½	5,634	5·51	310·31	250	Sr. 2	
			Brookfield Jessamine 5th	29289	18.10.30	11½	5,619	5·14	288·77	270	Jr. 3	231
			Rosalind 8th of Brookfield	21562	24.10.30	12	6,386	4·90	313·17	350	Mature	297, 363, 412
			Jessamine 4th of Brookfield	21559	23.11.30	22	7,424	4·31	319·94	350	Mature	
			Rosalind 9th of Brookfield	21563	26.11.30	18½	6,966	5·22	363·84	350	Mature	244, 326, 333

* 210 days in Test. † 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Pattison, F., Tongala (Ayrshire)	3	1	Willow Park Nell ..	22242	2.10.30	12	6,729	4·15	279·53	230	Jr. 2	
			Willow Park May ..	16927	13.10.30	17	8,268	3·68	304·64	330	Sr. 4	
			Willow Park Victoria	16928	12.11.30	8½	6,365	4·08	259·96	310	Jr. 4	
Pettitt Bros., Geelong (Ayrshire)	7	3	Blinkbrae Bonny ..	19560	1.10.30	18	6,733	4·19	282·29	250	Sr. 2	
			Blinkbrae Vida 4th ..	17346	3.10.30	21½	5,955	4·07	242·40	250	Sr. 2	
			Blinkbrae Lady Violet	19561	18.10.30	16½	5,656	4·61	260·84	230	Jr. 2	
			Blinkbrae Melody ..	19564	20.10.30	13½	4,984	4·20	209·44	230	Jr. 2	
			Blinkbrae Melba 7th ..	17343	21.10.30	9	5,723	3·99	228·22	270	Jr. 3	
			Blinkbrae Vida 2nd ..	15767	23.10.30	18	8,492	3·70	314·34	350	Mature	293, 324
			Blinkbrae Melba's Pride	19563	1.11.30	14	6,249	4·63	289·14	230	Jr. 2	
Phillips, J., Murraydale (Jersey)	6	1	*Peri Hope 2nd ..	23363	1.10.30	4	5,325	4·76	253·60	350	Mature	224, 227
			Peri Carnation 2nd ..	26129	14.10.30	15½	5,372	5·53	297·34	310	Jr. 4	216, 318
			Carnation of Peri ..	17818	11.11.30	15½	7,346	4·58	336·19	350	Mature	221, 280, 295, 319, 286
			Vanilla of Peri ..	18914	16.11.30	16½	6,755	5·56	375·38	350	Mature	286, 302, 366
			†Peri Empire 3rd ..	26131	4.12.30	4	2,730	5·94	162·28	310	Jr. 4	205, 278
			Peri Carnation 3rd ..	26130	24.12.30	9½	5,433	4·35	236·23	310	Jr. 4	207, 233
Plattfuss, J., Tongala (Friesian)	10	6	Darenth Rose Posch ..	2422	6.10.30	18	11,964	3·09	369·75	350	Mature	
			Greenvale Oakwood Galatea 2nd	3107	18.10.30	20	13,028	2·95	384·32	290	Sr. 3	243, 233
			Greenvale Graceful Segis	3102	19.10.30	20	9,933	3·37	334·30	270	Jr. 3	274
			*Glen Elgin Patchline de Kol	3095	28.10.30	4	7,815	3·28	256·63	350	Mature	215, 209
			Riverbank Spring Patch	2245	4.11.30	9½	9,756	3·81	371·30	350	Mature	339, 315
			Greenvale Dutch Girl	2769	15.11.30	15	10,224	3·35	342·18	310	Jr. 4	410, 527
			Greenvale Topsy Paxton	3109	25.11.30	5½	8,778	3·24	284·21	290	Sr. 3	232, 271
			Burnbank Spring Patch	1819	26.11.30	16	10,797	3·19	344·12	350	Mature	312, 252, 304, 361, 343
			Greenvale Oakwood Empress	3106	27.11.30	17½	8,589	3·31	283·92	310	Jr. 4	257, 268
			Greenvale Plebe Paxton	Vol. 10	28.11.30	20	8,559	3·20	273·99	230	Jr. 2	
Powell, J., Camperdown (Jersey)	3	2	Lily of Allambie ..	18919	1.10.30	16	8,241	4·14	340·80	350	Mature	315
			Mount Violet Silver Queen	24552	1.10.30	16½	7,358	4·99	367·23	270	Jr. 3	222, 321
			Mount Violet Kyeema	23374	29.10.30	16	7,850	4·92	386·01	310	Jr. 4	303
Poyner, R., Lilydale (Jersey)	2	..	Cream Belle of Kirkhill	21519	23.10.30	10½	5,903	5·11	301·66	350	Mature	270, 360, 376
			Kyora Foch's Anthem 2nd	23405	26.10.30	10	6,186	4·95	306·26	350	Mature	285, 317, 324
Prout, A. P., Leongatha (Jersey)	4	4	Wattle Vale Golden Girl	24307	28.9.30	9	8,481	5·67	480·83	290	Sr. 3	366, 413
			Wattle Vale Sunny ..	26311	20.10.30	18	7,280	5·56	405·07	270	Jr. 3	321
			Wattle Vale Dream ..	24305	20.11.30	10½	6,620	5·10	337·89	310	Jr. 4	317, 342
			Pineleigh Golden Lass	Vol. 19	9.12.30	16½	5,031	6·05	304·26	230	Jr. 2	
Quigley and Bennett, Yinnar (Jersey)	2	1	Jenny Lind 20th of Melrose	17514	2.12.30	13½	6,005	5·41	324·67	350	Mature	212, 275, 313, 295, 308
			Ellendale Kirsty 5th ..	29322	16.12.30	10½	5,185	5·75	297·91	250	Sr. 2	288
Raleigh, Miss H. E., Pakenham Upper (Jersey)	1	..	Burnside Gavotte ..	24558	29.9.30	12	4,824	5·88	283·66	310	Jr. 4	341, 246
Read, J. D., Springhurst (Jersey)	1	1	Tulip 4th of Springhurst	21601	30.10.30	10½	5,768	6·14	354·27	330	Sr. 4	305, 434

* 240 days in Test. † 210 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Richardson, W. S., Bacchus Marsh (Jersey	6	1	Charmain 3rd of Warenda	17802	30.9.30	12½	6,272	5·63	352·83	350	Mature	345, 350, 443, 297
			Garenne 5th of Warenda	15557	25.10.30	11	5,544	5·54	306·92	350	Mature	
			Silvermine 34th of Banyule	18813	25.10.30	15	6,315	4·87	307·44	350	Mature	281, 349, 231
			Sutton Lea Latricia ..	23395	2.11.30	12	4,422	6·27	277·43	350	Mature	235, 195, 294
			Sutton Lea Jenny ..	23394	3.11.30	9½	4,731	6·57	310·61	330	Sr. 4	237, 265, 292
			Butter Queen 3rd of St. Albans	21371	22.11.30	20	5,907	5·49	324·26	350	Mature	289, 334, 317, 230
Robinson, Miss S. L., Kew (Jersey)	7	3	Kyora Twinkle 2nd ..	15044	4.10.30	..	5,057	5·43	274·66	350	Mature	326, 289
			Kyora Creamy 4th ..	29370	8.10.30	17½	5,855	5·69	333·03	270	Jr. 3	308
			Sybils Oakleaf of Woodside	21625	14.10.30	19½	6,626	5·34	354·00	350	Mature	208, 233, 342
			Kyora Bonnie's Chance	26440	2.11.30	9½	4,705	5·28	248·40	250	Sr. 2	237
			Naldera of Woodside ..	14170	4.11.30	13½	7,335	4·51	330·85	350	Mature	293, 340, 373, 312, 367
			Lady Montrose of Woodside	16745	13.12.30	18	6,207	4·75	294·93	350	Mature	280
			Kyora Easter Daisy ..	Vol. 18	15.12.30	11½	4,055	6·18	250·64	230	Jr. 2	
Rogen, W. P., Tatura (Jersey)	4	4	Wompini Jessica ..	29483	30.9.30	20	7,050	5·57	392·56	230	Jr. 2	
			Aveley Emmeline 2nd	29375	14.11.30	17½	6,606	5·14	339·59	230	Jr. 2	
			Kantara Clementine ..	29377	10.12.30	19	6,830	5·04	344·42	230	Jr. 2	
			Kantara Mayflower ..	29383	23.12.30	20	6,117	5·66	346·03	230	Jr. 2	
Runciman, C. M., Murraydale (Jersey)	1	..	Bideford Cream Stockings 2nd	Vol. 18	26.12.30	20	4,385	5·05	221·60	230	Jr. 2	
Ryan, D. M. and Sons, Pirron Yallock (Illawarra Shorthorn)	5	5	*Nobby of Fairfield ..	Vol. 1	3.10.30	4	6,570	4·00	263·03	230	Jr. 2	
			Jewel of the Pines ..	10131	12.10.30	14	9,381	3·94	370·06	290	Sr. 3	324
			Diamond of Lawarra ..	Vol. 1	15.10.30	27½	9,981	3·44	343·63	230	Jr. 2	
			Beauty of Lawarra ..	Vol. 1	19.11.30	18	9,393	3·56	334·82	230	Jr. 2	
			Rocket of Fairfield ..	Vol. 1	19.11.30	17	8,645	3·39	293·39	250	Sr. 2	
Salesian College, Sunbury (Ayrshire)	4	0	Rupertswood Spotless	20712	27.10.30	13½	4,827	3·46	167·25	230	Jr. 2	
			Rupertswood Patience	22058	7.11.30	20	8,879	3·70	328·13	350	Mature	201
			*Rupertswood Lady Mac	20710	8.11.30	4	6,405	3·38	216·34	350	Mature	261
			Rupertswood Rose ..	22059	2.12.30	9	7,299	4·44	323·76	350	Mature	195, 196
Schier, A. H., Kernot (Ayrshire)	13	3	*Scotswood Silkie ..	16629	5.10.30	4	6,000	3·86	231·53	330	Sr. 4	208, 231
			Scotswood Shirley ..	22079	9.10.30	12	6,381	4·77	304·32	230	Jr. 2	
			Scotswood Fragrance ..	16609	10.10.30	12	8,946	4·08	365·34	330	Sr. 4	208, 245
			*Scotswood Blanche ..	18913	14.10.30	4	5,730	3·63	208·21	350	Mature	225, 236, 207, 198
			*Scotswood Jean ..	22073	21.10.30	4	5,857	3·89	228·11	230	Jr. 2	
			Scotswood Matron ..	23229	31.10.30	10	5,402	4·56	246·39	230	Jr. 2	
			Scotswood Merry Lass 2nd	23232	4.11.30	6½	4,250	4·22	179·46	230	Jr. 2	
			†Oakbank Gwendoline	15243	21.11.30	4	3,135	3·85	120·77	350	Mature	228, 153
			Scotswood Mabs ..	11367	27.11.30	13	7,853	4·37	342·79	350	Mature	234, 244, 221, 271, 280
			Scotswood Violet ..	20752	30.11.30	13	6,338	3·88	245·77	270	Jr. 3	220
			Scotswood Madeline ..	22074	3.12.30	6½	3,423	4·71	161·22	230	Jr. 2	
			Scotswood Bud ..	15473	4.12.30	N.O.C.	6,314	4·11	259·26	350	Mature	175, 266, 248
			*Scotswood Bella ..	22066	15.12.30	4	3,945	4·19	165·10	230	Jr. 2	
Schier, H. A., Bamawn (Jersey)	7	5	Preston Trinket ..	25597	29.9.30	13	6,857	5·62	385·42	250	Sr. 2	373
			Princess 5th of Grangelea	18448	4.10.30	5½	8,149	5·82	392·48	350	Mature	413, 429, 392, 279
			Green View Janette ..	21649	27.10.30	8	7,599	5·31	403·72	350	Mature	356, 315, 365
			‡Sutton Lea Airbright	29455	10.11.30	..	5,475	5·81	318·26	230	Jr. 2	
			Ruby of Taff Vale ..	17832	2.12.30	14	6,873	5·15	354·03	350	Mature	353, 307, 320
			Stumpy of Belgonia ..	13756	6.12.30	5½	5,543	4·95	274·53	350	Mature	331, 421, 472, 467, 498, 452
			*Jenny Lind 2nd of Taff Vale	17831	14.12.30	4	4,830	4·51	218·00	350	Mature	352, 349, 396, 349

* 240 days in Test. † 180 days in Test. ‡ 240 days in Test, withdrawn on account of sickness.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Schlipalius, A. J., Kilmany South (Jersey)	2	..	Fairbank Queenie ..	24598	1.10.30	7½	4,997	5·26	262·71	270	Jr. 3	191
			Butterfly of Fairbanks	18962	7.12.30	9	4,668	5·38	250·91	350	Mature	185, 313, 310
Sebire, T., Wandin Yallock (Jersey)	2	..	Flower of Moyaver ..	15461	29.9.30	8½	5,791	5·74	332·27	350	Mature	337
			Moyaver Freda ..	21680	18.10.30	8½	5,480	5·62	307·77	350	Mature	314
Sell, C. H., Irrewillipe East (Jersey)	1	..	Daisy of Avalon ..	18617	2.10.30	11½	4,520	6·50	293·80	350	Mature	300
Sewell, Dr. S. V., Berwick (Friesian)	2	1	Roads End Rhode ..	3200	8.10.30	16	9,146	2·81	257·32	330	Sr. 4	285
			Burnbank Inka Flower Triumph	2122	24.10.30	N.O.C.	10,810	3·76	406·22	350	Mature	295
Sharp, C. L. V., Murrabit (Friesian)	1	..	*Rolleston Alcartra Dekol	3202	12.12.30	4	4,135	3·50	144·62	250	Sr. 2	150
Simpson, T. E. and Son, Lower Ferntree Gully (Jersey)	4	4	Hazeldale Pearlie Maid	29123	2.10.30	N.O.C.	5,259	6·39	336·12	270	Jr. 3	344
			Eminent's Chloe 5th of Clarendon Eyre	16348	8.10.30	16	9,584	4·46	427·59	350	Mature	245, 437, 438
			Heather Belle of Aberdour	18972	8.10.30	13½	8,040	5·22	419·93	350	Mature	254, 289
			Molly Bawn 2nd of Dalebank	16796	2.11.30	14½	8,676	5·04	437·29	350	Mature	
Smith, E. L. and Sons, Woodend (Friesian)	1	1	Halecote Oakleaf Fobes	600	1.11.30	19	12,429	3·47	430·68	350	Mature	299, 466, 642, 693, 585, 677, 639
Stockdale, J. and M., Traralgon (Jersey)	3	2	Blair Athol Irene ..	19519	17.10.30	15½	5,790	5·09	294·86	230	Jr. 2	
			Glen Elva's Treasure ..	26141	4.11.30	10	4,830	4·96	239·69	350	Mature	
			Linga Longa Golden Wattle	25619	13.11.30	9½	6,064	5·78	350·65	310	Jr. 4	
Stoll, Mrs. L. T. Rokeby (Jersey)	3	2	Welbourne Sparklight's Lady	26372	22.11.30	12½	7,923	4·70	372·22	350	Mature	
			Cloverbank Camellia's Joy	Vol. 18	29.11.30	12	5,285	6·24	329·76	230	Jr. 2	
			Linga Longa Camellia 2nd	26371	25.12.30	11½	5,325	5·71	304·24	350	Mature	
Sutton, H. and Sons, Callignee (Jersey)	2	2	Latrobe Princess 6th ..	25422	9.11.30	14	5,325	5·00	266·14	230	Jr. 2	
			Latrobe Stella 7th ..	25427	17.11.30	10	5,535	5·07	280·86	230	Jr. 2	
Taylor, W. G., Caldermeade (Ayrshire)	6	2	Eldorado Lady Bright	17796	10.10.30	6½	8,471	4·03	341·15	270	Jr. 3	298
			Eldorado Heather ..	19867	13.10.30	7½	4,746	4·63	219·89	230	Jr. 2	
			Eldorado Sheba ..	21356	10.11.30	8	4,109	4·18	171·88	230	Jr. 2	
			Gowrie Park Sherlie ..	18160	12.11.30	14½	8,094	3·73	302·22	350	Mature	247, 338, 244
			Eldorado Queenie ..	15974	6.12.30	12	8,514	3·96	337·28	310	Jr. 4	352, 274
			Eldorado Snowflake ..	17798	7.12.30	7½	6,852	3·81	260·84	270	Jr. 3	271
Telford Bros., Kyabram (Ayrshire)	2	1	Hyde Park Primrose ..	20364	10.10.30	16½	6,602	4·22	278·63	230	Jr. 2	
			Hyde Park Crystal ..	20362	18.12.30	19	6,012	3·74	225·09	230	Jr. 2	

* 240 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Tomasetti, B. G., Drouin West (Ayrshire)	2	2	Leithvale Leila ..	20468	27.10.30	11	7,041	4·47	314·79	270	Jr. 3	
			Glencorren Bonnie Belle	20118	25.11.30	18	6,954	4·31	299·40	230	Jr. 2	
Trevaskis, F., Tongala (Jersey)	2	2	Model of Ballara ..	19000	9.10.30	24	10,172	5·46	555·28	350	Mature	393, 448, 595, 619
			Model 2nd of Ballara ..	21712	27.11.30	8	6,424	5·34	343·34	330	Sr. 4	293, 395, 483
Trigg, T. H., Dennington (Jersey)	6	1	Lipook Little Madge ..	Vol. 18	28.9.30	4½	4,356	4·71	205·25	230	Jr. 2	
			Lipook Sylvia ..	19961	1.10.30	16	7,998	4·29	342·96	310	Jr. 4	395
			Ginger Princess of Glen Iris	12964	5.10.30	10	5,622	5·59	314·20	350	Mature	213
			Lipook Lady Rose ..	Vol. 18	12.10.30	8	3,458	5·34	184·67	230	Jr. 2	
			Lipook Boronia ..	Vol. 18	20.10.30	9½	3,290	5·85	192·49	230	Jr. 2	
			*Lipook View Rose ..	Vol. 18	24.10.30	4	3,510	4·89	171·67	230	Jr. 2	
Tuckey, J. F., Alberton (Ayrshire)	1	1	*Tregorland Ingenue ..	22155	20.10.30	4	5,355	4·41	236·17	230	Jr. 2	
Tulloch, W., Loch .. (Ayrshire)	3	..	Carrara Gladness ..	19708	1.10.30	9	5,162	4·20	216·60	230	Jr. 2	
			†Dairymaid of Rochfield	8252	21.11.30	4	4,545	3·97	180·45	350	Mature	221
			†Scotswood Mode ..	16624	24.12.30	4	3,825	4·14	158·40	330	Sr. 4	186
Unthank, J., Somerville (Jersey)	2	1	Mooroodue Dianah ..	Vol. 18	12.10.30	12	4,068	6·04	245·89	230	Jr. 2	
			*Mooroodue Jewel ..	Vol. 18	25.11.30	4	3,060	5·28	161·69	230	Jr. 2	
Van Brummelen, J. K., Ferntree Gully (Friesian)	4	4	Bolero Sylvia's Queen ..	..	10.11.30	22½	9,119	3·43	313·20	250	Sr. 2	
			St. Alban's Holland Queen ..	..	14.11.30	18	12,209	2·98	363·85	350	Mature	
			Bolero Korndyke Posch ..	..	7.12.30	24½	9,221	3·35	309·36	230	Jr. 2	
			Bolero Korndyke Belle ..	..	8.12.30	20	6,746	3·89	262·22	230	Jr. 2	
Vaughan Bros., Girgarre (Jersey)	4	4	Dolly 2nd of Lynroy ..	17852	8.11.30	15½	7,940	5·29	419·98	350	Mature	
			Lynroy Fairy 3rd ..	24631	8.11.30	12½	7,895	5·35	422·30	330	Jr. 4	408
			Lynroy Pixie ..	C.R.	13.11.30	14	5,324	5·90	314·15	230	Jr. 2	
			Lynroy Nancy 3rd ..	26269	22.11.30	13	8,304	5·42	450·35	290	Sr. 3	426
Walker, C. S., Swan Hill Jersey	1	1	Warwick Princess Ivy	26271	12.10.30	24½	8,789	4·54	398·63	330	Sr. 4	320, 344
Walkley, E. E., Glen Forbes (Jersey)	2	1	Glenburnie Queen ..	Vol. 18	10.10.30	9	3,854	5·03	193·95	230	Jr. 2	
			Airlie Isla 2nd ..	28672	18.11.30	7½	6,330	4·83	305·88	290	Sr. 3	
Wallace, A., Bendgo (Ayrshire)	6	..	Spring Dale Flower ..	20754	30.9.30	8	5,925	4·06	240·81	250	Sr. 2	
			Spring Dale Duchess ..	18938	20.10.30	4½	6,199	4·23	262·21	290	Sr. 3	297
			*Glen Cooee Dot ..	15084	20.10.30	4	7,710	4·06	313·31	350	Mature	339
			*Spring Dale Lady ..	18939	20.10.30	4	6,035	3·93	237·23	270	Jr. 3	255
			*Spring Dale Dainty ..	16716	2.11.30	4	6,955	3·97	276·11	310	Jr. 4	315
			Spring Dale Belle ..	15622	25.12.30	4	6,595	3·57	235·12	350	Mature	349, 390
Wallace, A., Bendigo (Jersey)	1	1	Preston Wattle Bloom	Vol. 18	19.10.30	10	7,267	4·41	320·58	230	Jr. 2	

* 240 days in Test. † 210 days in Test.

STANDARD HERD RECORDS—*continued.*

Owner.	No. completed Test.	No. Certificated.	Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Class.	Previous Yields of Butter Fat.
						lb.	lb.		lb.			
Warragul High School, Warragul (Red Poll)	2	..	†Gipps Rosette ..	2186A	22.10.30	4	2,820	3·91	110·18	250	Sr. 2	204
			Gipps Sappho ..	2187A	25.12.30	11	4,176	3·95	164·80	230	Jr. 2	
Watts, J. S., Stanhope (Jersey)	5	4	Kantara Trethella's Jenny	26204	1.10.30	22	8,166	6·52	532·49	270	Jr. 3	534
			Flower 13th of Melrose	13343	20.10.30	17	6,875	5·96	409·69	350	Mature	319, 340, 298, 279
			Langi Fashion Girl ..	Vol. 18	20.10.30	10	3,164	6·37	201·67	230	Jr. 2	
			Kantara Jessica ..	24580	14.11.30	19½	8,993	4·62	415·60	290	Sr. 3	325
			Kantara Violette ..	26205	6.12.30	17½	7,178	5·61	403·01	270	Jr. 3	305
Watson, H., Leongatha (Jersey)	5	5	*Dumfries Sylvie ..	24585	28.9.30	N.O.C.	7,287	4·73	344·73	310	Jr. 4	301
			Hazel Grange Keepsake	Vol. 18	2.10.30	N.O.C.	5,954	5·91	351·86	230	Jr. 2	
			Hazel Grange Kitty ..	Vol. 18	2.10.30	N.O.C.	5,747	5·89	338·53	230	Jr. 2	
			Kitty 8th's Duchess of Round Hill	21337	4.10.30	N.O.C.	7,521	5·72	429·95	350	Mature	348, 247
			†Kitty's Duchess of Round Hill	21334	6.10.30	N.O.C.	7,140	4·96	354·33	350	Mature	295, 354
Webb, H. L., Sunbury (Ayrshire)	4	2	Holly Green May ..	20335	5.10.30	10½	4,970	4·79	238·27	230	Jr. 2	
			Holly Green Mermaid ..	20337	26.11.30	18½	5,912	4·13	244·26	230	Jr. 2	
			Holly Green Quiver's Queen	20341	23.12.30	13½	4,839	4·11	198·92	230	Jr. 2	
			Holly Green Princess ..	20338	25.12.30	16	5,420	4·02	217·92	230	Jr. 2	
Webb, S. K., Neerim North (Jersey)	1	..	Bel Royal Signorita ..	29595	29.10.30	7	2,858	5·44	155·58	230	Jr. 2	
West, J. C., Notting Hill (Illawarra Shorthorn)	5	4	Birdie 2nd of the Pines	18146	4.12.30	19½	6,437	4·38	281·96	270	Jr. 3	
			Middlemount Reddie 2nd	15161	6.12.30	22	6,336	3·90	247·03	230	Jr. 2	
			Tottie 8th of Alne Bank	11569	15.12.30	22	7,014	4·07	285·53	230	Jr. 2	
			Mabel 4th of Monana	14309	15.12.30	21	7,145	3·88	277·21	330	Sr. 4	
			Crummy 6th of St. Elmo	14317	25.12.30	25	7,169	4·02	288·55	270	Jr. 3	
Westlake, W. O., Portland (Jersey)	4	3	Grangelea Pansy 2nd ..	23005	18.11.30	16½	6,395	5·56	355·56	350	Mature	325, 356, 377
			Homebush Queen ..	29603	6.12.30	17½	5,819	5·03	242·49	270	Jr. 3	289
			Pansy of Grangelea ..	18649	10.12.30	13	7,154	4·61	330·03	350	Mature	347, 343, 326, 376
			Homebush Duchess ..	29602	11.12.30	18	7,544	4·42	333·12	270	Jr. 3	289
Wood, J. V. M., Heidelberg (Jersey)	7	7	Werribee Fancy Madeira	17715	30.9.30	N.O.C.	11,249	5·56	625·71	350	Mature	486, 512, 647
			Clarendon Eyre Country Mouse	Vol. 18	5.10.30	N.O.C.	8,070	5·00	403·11	270	Jr. 3	324
			Clarendon Eyre Pinafore	29626	1.11.30	17	7,058	6·26	441·85	270	Jr. 3	360
			Clarendon Eyre Bella Donna	Vol. 18	28.11.30	24½	7,107	5·91	420·28	230	Jr. 2	
			Clarendon Eyre Utopia	29628	29.11.30	25	7,259	6·12	443·96	230	Jr. 2	
			Clarendon Eyre Sleeping Beauty	Vol. 18	2.12.30	15½	5,340	5·49	293·26	250	Sr. 2	
			Woodside Sybil's Cunning Mouse	23528	15.12.30	19½	7,353	4·79	352·25	350	Mature	266, 372, 330
Woodmason, W., Oakleigh (Jersey)	4	4	Melrose Jessie 47th ..	25700	5.11.30	13½	6,525	6·31	411·69	310	Jr. 4	231, 355
			Melrose Zoe 9th ..	25707	15.11.30	18	7,442	6·29	467·98	350	Mature	282, 317, 389
			Melrose Graceful Duchess 44th	25696	24.11.30	16	5,402	6·81	367·62	290	Sr. 3	235, 316
			Melrose Graceful Duchess 41st	23532	8.12.30	17½	7,591	5·36	406·83	350	Mature	201, 354, 380
Young, G. T., Sedgwick (Jersey)	3	3	Preston Maiden's Gift	Vol. 18	22.10.30	16½	5,736	4·34	248·84	230	Jr. 2	
			Preston Czarina ..	15655	24.10.30	21	7,460	4·97	370·76	350	Mature	467
			Preston Boronia ..	26470	7.12.30	22½	7,692	5·10	392·00	310	Jr. 4	383

* 253 days in Test. † 210 days in Test, withdrawn on account of sickness.

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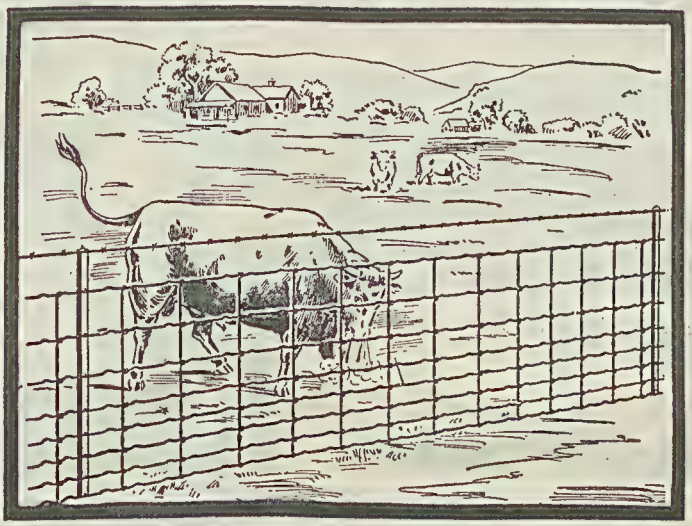

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No. 4—Ex Victoria Barcarolle (2303 A)	Dropped 11th Sept., 1931	..	17 ,,
No. 5—Ex Victoria Balmy Breeze (2302 A)	Dropped 3rd Nov., 1931	..	17 ,,
No. 6—Ex Victoria Vesuvius (2344 A)	Dropped 6th Nov., 1931	..	11 ,,
No. 7—Ex Victoria Rebel (2333 A)	Dropped 8th Nov., 1931	..	20 ,,
No. 8—Ex Victoria Amarylis (2301 A)	Dropped 16th Nov., 1931	..	12 ,,

The prices quoted are based on the butter-fat production of the dam at the rate of 1/- per lb., except in the case of progeny of heifers without completed test, the price then being 10 guineas.

Inspection cordially invi[illegible] or further particulars apply to—

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